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## VACCINATION AGAINST DIPHTHERIA

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# The Public Health Journal

VOL. XIX

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## Sunlight---Its Effect on the Growth of Children and Resistance to Disease

ALAN BROWN, M.B.

**B**EFORE proceeding with the subject indicated in the title of my address it will be necessary to explain a few points in regard to rickets and the so-called vitamin<sup>es</sup>. The disease rickets is a condition that is produced through inadequate bone salts, thus producing soft bones, and, in addition a general lowering of all the body processes. It is more particularly observed between the ages of two to eighteen months. Premature babies are very prone to rickets on account of the fact that the bone salts are laid down during the last two months prior to birth. All babies are potential cases unless very special efforts are made to guard against its development. Besides the bone changes in these infants, there exists a general lack of resistance to disease on account of the altered chemical changes in the body and weakened digestive processes. You will therefore see that this condition is a very serious one because it affects the body in almost all of its reactions to life. It has been variously estimated that approximately 90 per cent of all infants in the temperate zone are afflicted with the condition in a mild form.

The vitamin<sup>es</sup> or accessory food factors are, as you all know, most essential for the proper growth of both animals and human beings. The vitamin<sup>e</sup> factor that prevents rickets is called the water soluble "D" and is found in the fat of cow's milk, egg yolk, and the extracts from fish liver, such as cod liver oil. Sunlight, whether from artificial or natural sources, exerts a most beneficial influence in the production of potent or activated vitamin<sup>e</sup> "D". For example, the cows that are fed on green pasture which has been irradiated by the sun produce a much more potent milk than the cows fed on dried fodder as in winter time; again, hens that are fed active cod liver oil or that are irradiated by means of either natural or artificial sunlight, produce a better egg as far as the vitamin<sup>e</sup> content is concerned. To revert to the human being again, we know that mothers who are constantly in the sunlight (whether natural or artificial) produce a breast milk for their babies which prevents the development of rickets; you will therefore see that if a mother is to supply enough accessory food factors in her milk she must also partake of nature's protection, viz., sunshine.

\*Public address at Prince of Wales College, Charlottetown, P.E.I., June, 1928. Annual Meeting at the Canadian Medical Association.

The most concentrated source of this antirachitic vitamine "D" is cod liver oil. In 1919 a German scientist showed that rays emanating from a mercury vapour quartz lamp (known as ultraviolet rays) would bring about just as effective a cure for or protection against rickets. These observations have been amply confirmed by many other observers. In 1921 it was shown that exactly the same results could be obtained by exposure to the direct rays of the sun. In 1925 it was discovered that foods that contain ergosterol could be rendered antirachitic by exposure to the ultra violet rays. An indication of the potency of ergosterol may be gleaned from the fact that the administration daily of 1/10,000 mgm. (30 gms. to 1 ounce, a milligram is 1/1000 of a gram) of activated ergosterol to a rat on a rickets-producing diet cures or prevents the disease and that 5 mgms. of this substance produces the same antirachitic effect as one litre (1 quart) of cod liver oil. The usual dose to a baby is one teaspoonful of cod liver oil three times a day and this is sufficient to prevent or cure rickets.

The curative effect of the rays from either a lamp or the sun is due to certain rays present in the ultraviolet section of the spectrum. The most intensive studies of the effect of sunshine on health have been made in the Swiss Alps. Sunshine is composed of invisible heat rays which have a wave length of 760 millimicrons or longer (a millimicron is one millionth of a millimeter in length), visible light which varies in length from 760 to 380 millimicrons and invisible ultraviolet rays which range from 380 to 290 millimicrons. The heat rays comprise about 60 per cent of the solar radiation, the visible rays 40 per cent and the ultraviolet or chemical rays less than 1 per cent. It has been found by experiment that the most effective preventive or curative rays from the sun are the shortest and range from 290-313  $\mu\mu$ . in length.

The short or ultraviolet rays are readily cut off by the smoke, dust and moisture in the atmosphere. It is therefore evident that they will be markedly reduced in winter time, and also in the early morning and late afternoon, when the rays have to pass through a greater distance of our atmosphere than when the sun is high in the sky. Dorno in the Swiss Alps found that the ultraviolet content of the midday sun in January was only about 10 per cent as great as that of the midday sun in July. He also found that the shortest ultra-violet rays found at midday in December were 12  $\mu\mu$ . longer than those found in July. No such measurements as these have been made in Canada or the United States until the present investigation.

Dorno's measurements are extremely important and interesting but cannot, however, be applied on this continent without reservation on account of the difference in local weather conditions and altitude.

As long ago as 1884 Kassowitz in Germany commented upon the fact that rickets was only observed in the fall, winter, and spring, thus showing a definite seasonal incidence. In view therefore of our present knowledge of the rôle played by sunshine in the prevention and cure of this disease through irradiation of both food and the living individual the importance of a study of the seasonal variation of its antirachitic effect is at once apparent.

In planning a study of this type to extend over a period of two years, many difficulties were encountered. We chose as our animal the albino rat and the question at once arose as to how this animal would stand exposure to below zero weather. There was no information to aid us in this regard so we had to construct especially heated cages. Each week throughout the period of observation from 30 to 40 rats were started under the desired conditions. They were fed a standard rickets producing diet. The majority were placed outside daily while controls were kept inside and carefully protected from all sources of ultraviolet rays. After four weeks they were all carefully examined.

A study of the sunshine records kindly furnished by the Dominion Meteorological Bureau situated within half a mile of the hospital showed the impossibility of attempting to obtain anything like a two hour daily exposure to sunshine throughout the year. It is therefore quite evident from the practical standpoint that it would be more valuable to simply put the rats out for a two hour daily period from 11 a.m. to 1 p.m., the same as an infant would be placed out-doors, regardless of the amount of sunshine during this period. Consequently a two-hour exposure means that for a certain percentage of this time sunshine was available, while for the remainder of the time the rats were receiving skylight or reflected light from the clouds and sky. Naturally, during the winter months, less sunshine was secured than during the summer months, but this does not interfere with the practical value of the conclusions. All the observations were made on the roof of the hospital, 5 storeys high and exposed to the dust and smoke of the average city.

The methods employed were those that are generally accepted for estimating the degree of growth in the bony system and included X-ray pictures of all the long bones.

*Results:* After comparing the chemical and X-ray examinations of the rats having a 2 hour daily exposure with those kept inside on the same diet, it was definitely shown that in Toronto there is a slight but definite antirachitic effect of sunshine during the winter months. At the end of February and the first week in March a very sharp increase occurs which is maintained through April and May. It was further observed that the antirachitic effect of April and May sunshine during the hours from 11 a.m. to 1 p.m. is approximately eight times as great as the antirachitic effect during December, January and the greater part of February. The effect of fresh cold air as an antirachitic factor was also studied and found to have absolutely no effect.

Our results in regard to the seasonal variation of the antirachitic effect of sunshine are of greater value for areas in approximately the same latitude as Toronto, as the antirachitic effect of sunshine is determined to a large degree by the height of the sun in the sky, which as you know varies with the latitude. A map of the North American continent shows that Toronto is in the same latitude as many of the thickly populated northern states, a fact which is seldom realized.

Our results for this midday period (11 a.m.-1 p.m.) are not only of interest

in view of the 2 hour daily exposure of the rats, but also of more value than the total daily hours of sunshine for comparative purposes, as infants cannot be exposed to the available sunshine from sunrise to sunset. Considering then the average values, it is seen that in January from 11 a.m. to 1 p.m. the sun was shining less than  $1/3$  of the time, in April,  $2/3$ , while in July it had increased to  $3/4$  of the time. The antirachitic effect of sunshine, as determined biologically with the rats, increased tremendously the last week in February and the first week in March, yet from a study of the meteorological tables there is apparently very little relationship between the amount of available sunshine and the increase in its antirachitic effect. The most probable explanation, therefore, is that the sudden increase of the antirachitic effect of the sun's rays in March is due to an increase in the shorter and more effective rays.

A second series of observations conducted along the same lines as previously indicated was carried out to observe the effect of *skyshine*. The term *skyshine* is used to designate the sun's rays which are reflected from the sky and clouds in contradistinction to the rays received directly from the sun itself. An object placed on the sunny side of a street receives not only rays from the sun but also reflected rays from the sky. If placed on the shady side of the street only the rays reflected from the sky, *i.e.* *skyshine*, are received. If the object is again placed on the sunny side of the street and a long cylinder pointed directly at the sun placed over it, the rays from the sky would be cut off by the walls of the cylinder and only the rays directly from the sun would pass along the inside of the cylinder to the object at the bottom. From a study of our X-rays and chemical findings it is found that the antirachitic effect of *skyshine* is approximately one-half to two-thirds as great as that produced by what is ordinarily called sunshine (*i.e.* rays from the sun plus reflected rays from the sky).

In view of the antirachitic effect of *skyshine*, which does not cause sunburn it is of interest to note that the burning or reddening of the skin which is usually taken as the unit of measurement of ultraviolet therapy must now be regarded simply as an accompanying phenomenon which may or may not be a measurement of the amount of ultraviolet rays received.

A third series of observations was conducted to test the value of various glasses permeable to ultraviolet rays. The glasses tested were Vita Glass, Vioray Glass and Corning Special Glass. The rats were exposed on the roof in their cages, which in turn were enclosed by the glass to be tested. The results obtained indicated that the antirachitic effect of the sun's rays through these special glasses is 25 to 50 per cent of the antirachitic effect obtained without the use of glass. No obvious difference could be detected in the efficacy of the three glasses. Rats were also placed in a room, one, three and five feet from an ordinary sized window glazed with Vioray Glass. The results obtained indicate that the value of *skyshine* passing into a room through an ordinary sized window glazed with special glass is practically negligible. This is what would be expected when one considers the extremely small percentage of the total sky which is visible through an ordinary sized window. In order

to obtain much benefit, it is necessary for the patient to receive the direct rays of the sun through the glass or to be exposed in a solarium which will allow rays to enter from a considerable portion of the sky.

A fourth set of observations was made on a series of the same rats controlled and fed and given sunlight as previously outlined to determine if there existed any increased resistance to disease in the rats that were exposed 2 hours daily to the sunshine. It was determined as a result of these studies that the resistance to disease was just twice as great among the rats that received the 2 hour daily exposure to sunshine, as those that were kept indoors. This is but another strong link in the chain of evidence which goes to show that children who are virtually reared out of doors have a greater resistance to disease because of the fact that their nutrition is superior to those reared as "hot-house plants".

A fifth series of observations was conducted again under exactly the same conditions. These studies consisted of an accurate measurement of the acidity of the intestinal contents of the rats at various levels of the bowel. The results showed a definite increased acidity throughout the intestines, as a result of exposure to sunshine, indicating of course, better digestion. This last conclusion has likewise been amply demonstrated in the human.

A sixth and final series of observations was made to determine the relation of the altitude of the sun in the sky to its antirachitic effect. In this last series of observations we were fortunate in enlisting the most valuable services of Professor Chant, Head of the Department of Astronomy of the University of Toronto.

It has been already pointed out that rickets is prevented or cured by exposure to ultraviolet rays not longer than 302  $\mu\mu$ . or possibly 313  $\mu\mu$ . Rays longer than these certainly produce no discernible effect. As the shortest rays in sunshine are 290  $\mu\mu$ . and the longest ones effective in the prevention and cure are 302 or 313  $\mu\mu$ ., it is quite evident that the effective rays are limited to a very narrow zone comprising the shortest ultraviolet rays present in sunshine.

It has been found that the ultraviolet end of the solar spectrum falls off very rapidly, and this rapid falling off has been attributed to absorption by the earth's atmosphere, and especially to one of its constituents, namely, ozone. This gas is situated largely in the outer limits of the atmosphere. In the lower layers of our atmosphere the effective rays are still further reduced by any smoke, dust and moisture present.

It has already been referred to that there is a marked seasonal variation in rickets and in accord with this we have recently demonstrated by animal experiments that the antirachitic effect of summer sunshine in the latitude of Toronto is approximately eight times as great as that of winter sunshine, while Dorno in the Swiss Alps, by means of photo-electric cells showed the ultraviolet content of the midday sun in July to be ten times greater than in January. It is thus evident that there is a marked seasonal variation in the antirachitic effect of sunshine.



The question naturally arises as to what produces this variation. Could it possibly be due to a variation in the emission of ultraviolet rays by the sun? It has been shown that there is a slight variation but it bears no relation to our seasons. Could this effect be produced by seasonal changes in the amount of ozone in our atmosphere? It is known that the greater part of the ozone is located in the most elevated strata of our atmosphere, probably above 50 kilometers. It is there produced by the action on oxygen of solar rays shorter than 200  $\mu\mu$ . However, rays longer than 200  $\mu\mu$ . decompose the ozone, so a state of equilibrium is thus established. From measurements made it is very improbable that a seasonal variation in the amount of ozone accounts for the seasonal changes in the antirachitic effect of sunshine.

From measurements made of the amount of smoke, dust and moisture in the atmosphere there is no evidence that changes in their concentration could account for the seasonal variation in the antirachitic effect of sunshine.

A most interesting observation by Fabry and Buisson was made in which they found that the intensity of the ultraviolet rays reaching us from the sun decreases rapidly when the sun departs from the zenith and this decrease is most marked with the short or most effective chemical wave-lengths. With observations made at Marseilles on June 7, 1920, they found rays 292  $\mu\mu$ . in length did not come through till 10.31 a.m., when the sun reached an altitude above the horizon of 62 degrees. Waves 296  $\mu\mu$ . in length were over 28 times as strong when the sun was at an altitude of 68 degrees (11.25 a.m.) as when it was at an altitude of 40 degrees (8.22 a.m. and 3.46 p.m.). The obvious explanation of these findings is that in the early morning and late afternoon or in the winter months when the sun is low in the sky, the rays have to pass through a greater portion of our atmosphere than at noon day or in the summer months. In other words, we would expect to find the antirachitic effect of sunshine largely dependent on the altitude of the sun.

In order, therefore, to determine whether the antirachitic effect is dependent on the altitude of the sun and not on possible seasonal changes in the atmosphere, we exposed rats at different times of the day throughout the month of March, 1928. Dr. C. A. Chant, Professor of Astronomy of the University of Toronto, kindly calculated for us the time each day during March at which the sun reached the altitudes of 25, 35, 40 and 45 degrees. Naturally, this was a different time each day for each altitude. Four rats were placed in each of eight cages. Cage 1 was exposed daily for 2 hours, being placed outside at a time so that 2 hours later, when it was taken in, the sun had reached an altitude of 25 degrees. This means that the rats in cage 1 received rays from the sun up to a maximum altitude of 25 degrees. Similarly the rats in cage 2 received rays from the sun up to an altitude of 30 degrees and so on up to 45 degrees.

During the four weeks of this observation, the 8 cages were put out or taken in at 448 different times of the day, ranging from 6.25 in the morning to 5.48 in the afternoon. At the conclusion of the four weeks, the usual tests of the rats were made. It was found that under the conditions stated above, a



marked increase occurs in the antirachitic effect of sunshine when the sun reaches an altitude of about 35 degrees in the spring and a marked decrease occurs at about the same altitude in the fall. It was observed also that the spring sunshine is slightly more active than the fall sunshine and that the morning sunshine is more effective than the afternoon sunshine. Figures furnished from the Dominion Meteorological Bureau estimated within a mile of the hospital show that differences in the amount of cloudiness could not have accounted for the results obtained. The probable explanation of our findings is that the atmosphere is clearer in the spring than in the fall and also clearer in the morning than in the afternoon.

A study of the geographical distribution of rickets in view of our results is particularly interesting. Before discussing this, however, we must consider certain fundamental factors concerned with the production of the disease. It must be remembered that, although there may be very effective sunshine in a district, if the patients do not go outside and receive this sunshine, it will do no good. We would expect to find rickets more prevalent in a country with a cold climate where the infants cannot get outside readily than in one with a warmer climate, although situated in the same latitude. Also, if the air is badly polluted by smoke and dust, which are factors under the control of man, the effectiveness of the rays will be markedly diminished. The value of certain contributory factors in the prevention of rickets may assume prior importance as is the case with the antirachitic vitamine in certain northern countries where it is consumed in large quantities in the form of fish liver. In view of the multitudinous factors known to influence the development or prevention of this disease, we would not expect the geographical distribution of rickets to fit in with any hard and fast rule concerning the altitude of the sun. Nevertheless it is surprising how closely the geographical distribution of rickets does coincide with our observations of the effectiveness of the sun's rays from an altitude of 35 degrees and over.

It has been pointed out that rickets is either unknown or exists in a mild form in Australia, New Zealand, India, Japan, parts of China, all of Africa, Jamaica and California. The minimum seasonal altitude of the sun at these places is as follows, the most southern part of Australia 30 degrees, the middle of New Zealand 28 degrees, northern India 31 degrees, the middle of China 32 degrees, the most southern part of Africa 33 degrees, Jamaica 50 degrees, San Francisco 30 degrees and Los Angeles 33 degrees. At many of these places the minimum seasonal altitude of the sun is slightly less than 35 degrees. However, as rickets requires one or two months to develop, this lower altitude which is only present for a short time, does not result in the production of the disease. It is evident the minimum seasonal altitude of the sun does not go below 30 to 35 degrees in the districts where rickets does not develop in spite of the presence of other conditions favourable to the development of the disease.

Rickets to-day occurs largely in Europe and North America, between the latitudes of 40 and 60 degrees. The minimum seasonal altitude of the sun at

40 degrees north latitude is 26 degrees. In Glasgow, Scotland, the minimum seasonal altitude of the sun is 11 degrees and for 6 months of the year the altitude is below 35 degrees. In London, England, the minimum altitude is 16 degrees and below 35 degrees for 5 months of the year. In Boston, Mass., the minimum altitude is 23 degrees and below 35 degrees for 4 months of the year, while in Baltimore, Md., the minimum altitude is 27 degrees and below 35 degrees for but 3 months of the year. As we have found a marked diminution in the antirachitic effect of the sun's rays when the altitude of the sun is below 35 degrees we should be able to predict for any city the period of the year during which rickets will probably develop.

During the hot summer months it is inadvisable to expose infants to the heat of the sun at mid-day. We have been accustomed in Toronto to expose infants before 10 a.m. and in the latter part of the afternoon during the summer. The time of day at which the sun reaches an altitude of 35 degrees in Toronto has been calculated for us by Professor Chant, from which it is evident that infants may be placed outside at any time between 8 and 8.30 in the morning and 4 and 4.50 in the afternoon and receive rays with the sun at an altitude of 35 degrees or more. These times apply to Toronto but naturally they can be calculated for any place.

#### GENERAL CONCLUSIONS

1. The sun's rays in December, January and February in the latitude of the city of Toronto produce a slight but definite antirachitic effect on rats fed a rachitogenic diet.
2. A very sharp increase occurs in the antirachitic effect of sunshine about the first of March.
3. The antirachitic effect of April and May sunshine is approximately eight times as great as that of December, January and February sunshine.
4. The antirachitic effect of skyshine (reflected rays from the sky and clouds) is approximately one-half to two thirds as great as that produced by what is ordinarily termed sunshine (rays from the sun plus the reflected rays from the sky.)
5. Reddening of the skin by ultraviolet rays is not a suitable unit for measurement of ultraviolet therapy. It should be considered simply as an accompanying phenomenon which may or may not be a measurement of ultraviolet rays received.
6. Sunlight which has passed through Vita Glass and Vioray Glass has from 25 per cent to 50 per cent of the antirachitic effect.
7. The use of Vita Glass is justified from March on as our inclement spring weather prohibits the exposure of patients to sunlight which at this time has a great antirachitic effect.
8. Sunshine definitely increases the resistance of albino rats to infection with a specific organism.

## PRACTICAL DEDUCTIONS

1. From the first of March till the middle of September the antirachitic effect of the sun's rays are eight times as great as during the other months of the year. The change begins abruptly at the first of March and ends suddenly at the end of the second week in September. An infant, therefore, exposed during these periods, even though on a rachitic diet, would be greatly benefited, the most suitable period of the day being between 11 a.m. and 1 p.m. except during the extremely warm weather when the earlier hours of the day would be more suitable.

2. Skyshine is approximately from 50-60 per cent the value of sunshine, that is to say, an infant placed on the shady side of the street would receive as much benefit as if it were on the sunny side. This is a point frequently unrecognized.

3. From September to March the antirachitic effect of the sun is so slight that the benefit to be derived is purely problematical and has yet to be determined with the human individual.

4. The use of the special glasses is of value from March to June when the chemical rays are very beneficial and the weather too inclement for outside exposure.

5. The experimental data in reference to the resistance of the rats to infection is very illuminating and undoubtedly indicates that the same effect would be derived by the human.

6. The increased acidity of the intestinal contents of the exposed rats is additional evidence that the sun's rays definitely aid in digestion.

7. A marked increase occurs in the antirachitic effect of sunshine when the sun reaches an altitude of 35 degrees or more.

8. A study of the geographical distribution of rickets shows that rickets is uncommon or exists chiefly in a mild form in those places where the minimum seasonal altitude of the sun is not below 35 degrees.

9. Conversely severe rickets is chiefly encountered in those cities where the altitude of the sun is below 35 degrees for some months of the year.

10. The period of the year during which rickets will probably develop can be calculated for any city in the world. The duration of this period may be altered, however, by the prevention of exposure of patients to highly effective sunshine on account of inclement spring weather or other factors.

Our thanks are due to the Department of Health of the Province of Ontario for a grant in aid of the expense of this investigation and to the Hon. Dr. Forbes Godfrey, Minister of Health, for his interest in this work and the authorization of the grant from his department.

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# The Complete Physical Examination in School Children

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INTEREST in the child and child welfare has been evident at all ages throughout history, but it is only during the past fifty years that the child has really come into his own rightful place and been recognized as the future hope of every nation. The great advances made in child welfare have been due in no small measure to medical supervision and physical examinations as now carried out in the schools of our provinces.

Also, from the great mass of information obtained through this work, it has been more than proven that there is a very close relationship between physical vigour and mental efficiency, and that a large percentage of school children are suffering from remedial defects, which have, in many cases, never been suspected by either parent or teacher, such as defective vision, nose and throat conditions, cardiac diseases, etc.

The objects of school medical supervision are as follows:—

1. To detect and correct defects in school children.
2. To make the teaching of public health an essential part of education, both to the parent and the child.
3. To educate the teacher to be more alert in detecting possible abnormalities in the child in the classroom.
4. To render children healthier, happier and more vigorous by the detection and exclusion of cases of parasitic and communicable diseases.
5. To obtain the co-operation of the school principal in order to produce a maximum of efficiency in the preservation of health.

In Toronto, every school child is given two complete physical examinations, the first, or junior, in the Jr. 1st grade, and the second, or senior, in the Jr. 4th grade. During the year 1927, we examined 22,848 children, and of this number 7,539 were found to be suffering from defects other than teeth. Also during that time, 6,423 defects were terminated in our records by one of the following ways:

(a) Family physician; (b) Natural means; (c) Under observation of family physician; (d) Parents refusing treatment; (e) Family physician deeming treatment unnecessary.

These examinations are all carried out by appointment, and every effort is put forth to have the parent present if at all possible. Of the total examinations done, parents were present in 11,020 cases. To our minds the

\*Read at the Annual meeting of the Ontario Educational Association, Toronto, April 2nd, 1928.

presence of a parent at the time of a child's examination is of paramount importance, in that we obtain a complete history of past illness and general health, often discovering such important details as a history of rheumatic fever or chorea, and fairly often a history of tuberculosis, not previously known, existing in a family. Lastly, the presence of the parent gives us a much better opportunity of getting home the important facts of public health and impressing the necessity of correction of defects when found during the examination.

If the parent is unable to be present for the examination a signed card is obtained which gives permission for removal of sufficient clothing to make the proper investigation.

We begin our examination with the eyes. Eye defects are divided into three groups: *External Diseases*, *Defective Vision*, and *Squint*.

*External Diseases*—The most common of these are conjunctivitis, blepharitis and styes.

*Defective Vision*—This is a very important subject to the school medical officer, for although he does not treat the defect, its detection and prevention, as a rule, must be carried out in the schools. Vision is tested by means of the smaller chart for children who know their letters, and by the illiterate chart using the letter "E" for the smaller children. These tests pick out the grosser defects, but unfortunately in some cases, exclude children with hypermetropia who are able to read the chart well, but have to strain their accommodation in order to do so. Then again, children are included whose eyesight is normal, but who do not read 6/6 owing to psychological factors.

Another obstacle encountered in many of our schools is the difficulty of finding a space at least six metres in length and with sufficient light to give the child a fair test. However, with care and perseverance we feel that children in need of treatment can be sorted out in a large majority of cases.

*Squint*—This defect is usually recognized quite early by teacher or parent, but one cannot emphasize too strongly the necessity of early treatment, knowing as we do that many a case which has gone on to dimness of vision, through delay, might have been saved, had treatment been instituted earlier.

#### EARS

When one stops to consider that the child obtains his knowledge through two channels, namely, the eyes, which we have just mentioned, and the ears, one realizes the importance of clearing up any defect present in these organs.

For our purpose, ear defects are divided into:

*Those with aural discharge.*

*Those showing symptoms of deafness.*

These two groups are very closely inter-related, since a large percentage



of cases showing discharge as a result of middle ear infection are suffering from some defect in hearing as well.

Chronic middle ear suppuration is very often the result of the exanthematous or infectious diseases such as scarlet fever and measles. Apart from these diseases, which are very materially helped in producing middle ear infection by poverty and parental neglect, an unhealthy condition of the nasopharynx, associated with chronic rhinitis or enlarged adenoids, is important.

Hearing is tested either by the conversational voice at twenty-five feet, the whispered voice at six feet, or by the use of a watch. Personally, I have often felt that these methods are not always satisfactory and that one sometimes misses cases of defective hearing. A method used in one of our large clinics can, I believe, be used in conjunction with these tests where there is any doubt. It is as follows—

- (1) The mother is asked whether she has noticed anything wrong with the child's ears such as discharge or deafness, and whether the child appears to make out everything that is spoken to him at home.
- (2) The child is asked if he makes out all the teacher says, and his position in the classroom is ascertained.
- (3) Lastly, if there is any doubt, a report as to his educational progress is obtained.

#### DEFECTIVE NASAL BREATHING

This defect is most commonly met with in examination of the nose, and is caused in most cases by enlarged adenoids. It assumes a very important rôle in our work when we consider that it is responsible for the greatest number of absentees from school, being the underlying factor in most head colds.

Adenoids give rise to symptoms in several ways:

- (a) The production of a "mouth breather" by nasal obstruction;
- (b) remote infection such as otitis media;
- (c) deafness (by retraction of the tympanic membrane) if so situated as to cut off entry of air into the eustachian tube;
- (d) reflex disturbance of the nervous system acting as a contributing factor in epilepsy, enuresis and other minor troubles;
- (e) lastly, adenoids are a very definite factor in many cases of malnutrition.

Considering these points it would appear that hypertrophy of adenoids associated with chronic rhinitis is a defect of major importance, and too much stress cannot be laid on its detection and correction.

#### ABNORMAL TONSILS

Tonsils have been marked defective more often in school children, possibly, than any other condition, and there is a continuous controversy as to the function of the tonsils, as well as criticism regarding the frequency with which they are removed. It is claimed that many conditions, such as acute arthritis and even general debility, can be caused by this condition. In school work we do not so often run across acute tonsillitis, but are repeatedly called upon to give an opinion as to the advisability of removal of tonsils in



chronic cases. Our own experiences justify, I believe, advising removal of this form of infection, when we consider the great improvement shown in cases of so-called "growing pains" as well as the decrease in infectious diseases, general debility and malnutrition, following tonsillectomy.

The principal points on which to base a diagnosis of diseased tonsils are:

- (1) The appearance, such as dilatation of blood vessels on tonsils and pillars; Swelling or oedema and pus in crypts.
- (2) Enlarged cervical glands draining tonsils.
- (3) History of frequent attacks of tonsillitis, quinsy or recurrent colds, etc.

Paying careful attention to these points, one should not go far astray when giving a decision as to whether tonsils are abnormal or not.

#### ANAEMIC APPEARANCE

In a small percentage of cases we encounter children of a pasty, pale or anaemic appearance. Fortunately, most of these are due to disregard of health rules, such as sleep, proper food, etc., but it is important to remember that a few may be due to one of the anaemias or leukaemia.

#### DIGESTIVE DISTURBANCE

In my experience this type of defect is seldom seen in school work, due, no doubt, to the fact that most cases are acute and treated accordingly by the family physician.

#### ENLARGED GLANDS

Lymphatic enlargement, especially of the cervical glands, is most common in children, due to teeth, nose and throat infections, etc.

In spite of this fact, however, one must be constantly on the lookout for such conditions as tuberculosis and Hodgkin's disease.

#### SKIN

Diseases of the skin such as psoriasis, favus and eczema are frequently seen during examinations, but in most cases the condition has been previously diagnosed and is under treatment. Our chief concern regarding the skin is the diagnosis and exclusion of communicable diseases such as impetigo contagiosa, ringworm and scabies.

#### ORTHOPOEDIC DEFECT

These conditions may be classed as follows—

*Congenital deformity* such as cleft palate, club foot, etc.

*Conditions resulting from general or local disease* such as empyema, rickets, etc.

*Paralytic cases* such as anterior poliomyelitis.

*Postural defects* arising during school life such as curvature of the spine.

Most orthopaedic defects are terminated before the child comes up for examination, except, of course, postural deformity.

This condition, I believe, concerns us most because of the fact that nearly all cases arise during school life, and much can be done to lessen these abnormalities by careful supervision and regulated exercise.

### MALNUTRITION

To judge the nutrition of a child, our standard is governed chiefly by a table of average weights, according to age and height, allowing a margin of 10 per cent below normal before considering a child malnourished.

Strange to say this condition does not seem to be affected to any great extent by the class of child examined. In fact I sometimes feel that we find more undernourished children in our more elite schools than in the poorer districts. However, I strongly believe that in addition to weight tables one must consider as well family characteristics, the child's general appearance, such as flabby muscles leading to fatigue posture, rounded shoulders, lordosis, abdominal protuberance, pallor, etc., with possibly a history of tiring easily and irritability.

According to Emerson, the causes of malnutrition are:

1. Physical defects, especially naso-pharyngeal obstruction.
2. Lack of home control.
3. Over fatigue.
4. Improper diet and faulty food habits.
5. Faulty health habits.

### PULMONARY DISEASE

Concerning diseases of the respiratory system the one we are most interested in is, of course, tuberculosis. In the majority of cases it involves the intra-thoracic glands. Those around the hilus of the lung are exceedingly difficult to diagnose clinically, but sometimes are manifested by increased mediastinal dullness and the Eustace Smith sign. It may exist, as we all know, without any obvious loss of general health, and for this reason, great care should be taken in examination of a potential case with a history of exposure to infection or one who appears pale and thin.

### CARDIAC DISEASE

The more common cardiac defects met with are:

1. *Rheumatic heart disease.*
2. *Congenital deformities of the heart.*
3. *Defective functioning of cardiac innervation.*

Most of our attention has been directed toward the rheumatic heart with a definite endocarditis, supervising the activities of the child at school in co-operation with the family physician with a view to strengthening the heart muscle and prevention of any overstrain. In every case where there is even a mild suspicion of rheumatism such as growing pains, sore throat, etc., the heart should be carefully examined and all foci of infection cleared up, paying particular attention to the throat. Too much care cannot be exercised in this respect, when we stop to consider how often rheumatism is overlooked in the early stages before endocarditis and chorea, etc. supervene, and knowing as we do that once we have cardiac involvement a recurrence at some later date is almost certain.

Nervous disorders may be classed as *functional* and *organic*.

Under the heading *functional*, we most frequently meet the so-called "nervous child". These cases usually have some exciting cause such as poor general health, improper social habits, vicious personal habits, overstimulation or intoxication; and, paying particular attention to these facts, one is often able to discover the underlying cause, which when corrected will greatly improve the condition.

Of the *organic* diseases, chorea and epilepsy are the most common. The symptoms or signs of chorea are fairly well known to most teachers, who are on the lookout for the irritable, restless child with jerky irregular movements. This condition must be differentiated from habit spasm, which is usually due to some local condition and characterized by spasmodic and powerful movements in contrast to the mild, jerky and irregular movements of chorea. Epilepsy is seldom diagnosed before the development of occasional or habitual convulsions. A knowledge of this condition is valuable to the teacher as well as the physician, since she possesses facilities for observation second only to those of the family and often more discerning.

#### THYROID

To complete our physical examination the last defect to be looked for is in the thyroid gland. A large percentage of goitres observed are of the type commonly found at puberty, but at times one runs across the active or toxic type. To my mind all cases of enlarged thyroid should be observed at intervals by the family physician.

To conclude, it is felt that, as a result of school medical supervision, the time is at hand when we shall see the elimination of pediculosis, a greater decrease in communicable disease, the rising generation raised to a higher type of physical development, and the parents themselves educated to such an extent as to consider public health an essential element in their child's education.

The child will possibly realize as time goes on that there is a lot to be gained by medical supervision, and in later years understand the value of periodic health examinations.

Medical inspection itself needs to be placed on a more businesslike basis. Adequate teacher-training in health examinations and health teaching is of great importance and should be more fully emphasized. The home must be brought into closer touch with the school in interest and knowledge of child health if we are to get very far.

The collection of more enlightening statistics and the subsequent effort to obtain remedial and preventive measures against the defects interfering with the education of the child must be added to the new object of prevention of disease in later life.

School inspection should be more closely co-ordinated with other departments of preventive medicine such as prenatal clinics, infant welfare clinics and hospitals in order to produce the best results.

# Co-operation of Health Departments and Hospitals\*

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*Medical Officer of Health, Edmonton*

C O-OPERATION of all health agencies in the community, a clear understanding of the part each has to play in promoting and securing the greatest degree possible of health, happiness and prosperity among the public generally, should be the objective of the different organizations which are here represented. Happiness and prosperity are included with health because no community can be happy or prosperous which has a low standard of general health. The economic loss entailed by disease, sickness and ill health is incalculable. The increasing cost to the individual or to the public generally of medical service, including hospital charges, makes it all the more important that that service should be so efficient as to reduce to a minimum the number of days of incapacity and to restore to health in the shortest possible time. This aspect of the situation should be stressed in dealing with the public, in order to counteract, as far as possible, the tendency to delay in calling in the aid of medical services on account of the expense or financial obligation involved. The owner of an automobile, if he is wise, when he observes some squeak or adventitious noise about the mechanism of his car, or any failure of its parts to function properly, does not delay in having it examined by an expert mechanic. In this he, at trifling expense, often prevents more serious developments which might be very costly and might involve great danger to life or limb. The same owner often fails to take the same care of the mechanism of his own body when he becomes conscious of its lowered efficiency. The periodic examination of individuals, apparently well, now so strongly advocated by the American Public Health Association, has much to commend it and is fortunately being increasingly adopted as a means to prevent, at its inception, a decline in health or efficiency.

The combination of the Health Officials' Association with the Hospitals' and Nurses' Association effected last year, and our meeting together as associated organizations in the interests of humanity, is a happy augury of what the future holds out in health service to the community. Health officials in the past have possibly devoted their energies and limited their endeavours too exclusively to the prevention of communicable disease. The tendency at present is to widen the scope of diseases in which health departments have a definite interest. At recent meetings of the American Public Health Association, the prevention of cancer and of heart disease were included in the programme for discussion, and the Health Department of New York State has definitely taken up the control of cancer as one of its

\*Read at the first annual meeting of the combined Alberta Health Officials' Association with the Hospitals' and Nurses' Association.

functions. On the other hand, the medical profession and professional nurses as well as hospital authorities have perhaps given their attention too largely to the cure or alleviation of diseased conditions without giving much time or thought to their prevention, where possible.

During the last year a committee of members of the American Public Health Association has sent out a letter and questionnaire to 247 health officers of cities and to 1,365 general, maternity, and children's hospitals in the 247 cities represented. The object was to obtain information regarding the relations between health departments and hospitals, and under this heading a preliminary report from this committee is given in the March number of the American Journal of Public Health. No specific recommendations are made at present. It is my purpose later to refer briefly to some things in this article and to indicate how far we have gone in Edmonton in adopting some of the ideas there indicated as advantageous, limiting my remarks to municipal hospitals for the isolation and treatment of communicable diseases.

It is a matter of history that it was only 40 years ago that, in England, contagious disease hospitals were built on an extensive scale, with the expectation that hospitalization would control the acute infectious diseases. That expectation has not been realized, as there has been no significant decrease in the morbidity rate, especially of scarlet fever, though the mortality rate has unquestionably been lowered. While it is probably correct to say this has been our experience also, it is nevertheless very important that municipal hospitals for the treatment of disease should be provided in every community, including rural, for the following reasons:

1. Because of the lack of proper facilities for isolation and treatment in the average home. This is particularly true of the rapidly growing cities and towns of Western Canada and the majority of homes in the country.
2. Because of the difficulty of having quarantine regulations properly observed at home, and the increased danger of communicating the disease to other members of the family not already infected.
3. Because in a well designed and conducted hospital we may more closely approach absolute isolation and keep the patient under conditions more liable to prevent complications arising.
4. Because, by removing the patient from the home, prolonged inconvenience to the well inmates, or financial loss, from interference with occupation and social intercourse, may be avoided or minimized.
5. Because medical or surgical cases in general hospitals not infrequently are incubating on admission some infectious condition which, when it develops, is a menace to other patients unless the patient is promptly removed and isolated. This, it should be possible to accomplish without endangering the patient's welfare or unduly interfering with the continuation of the medical or surgical treatment being given. This situation can be best met through having in the same neighbourhood a properly equipped isolation hospital to which all such cases can be transferred.

It is a matter of experience that the prompt removal of a case of



diphtheria or scarlet fever from a home, very frequently means the protection of other inmates and the limitation of the disease to the individual removed. With measles, chickenpox, mumps or whooping cough, however, this is not the case, as all susceptible cases are usually in the incubation stage before the first case is discovered or removed. In well conducted hospitals, moreover, it has been demonstrated that the death rate is usually less than half what it is among cases treated at home. We have only to visit the homes of the poorer classes from which the majority of our patients come, to realize why this should be the case. Both from the standpoint of the patient himself and the community generally it is advantageous that the majority of our cases, excepting those of the minor diseases, should be treated in an isolation hospital equipped and conducted in such a manner that the patient himself not only receives the best of care and treatment for the particular disease he has, but is protected against acquiring other diseases which are being treated or which other patients may bring into the institution, though impossible of diagnosis at the time of admission. During 1927 our Isolation Hospital cared for 92 per cent of the scarlet fever and 90 per cent of the diphtheria with most satisfactory results. Of 54 cases of smallpox 61 per cent or 33 were also provided for in a specially isolated ward. This arrangement for the care of smallpox is very satisfactory and absolves the board of health from the heavy expense of providing for smallpox in a separate building as was formerly thought to be necessary. Now that our Public Health Act permits of quarantining and treating smallpox cases in the home at the discretion of the medical officer of health, we expect to be able to handle smallpox satisfactorily with this small isolated ward of 4 beds, unless unfortunately an epidemic of unusual proportions should develop. In following this course we are not unique, apparently, judging from the report on this matter by the committee of the American Public Health Association already referred to, which is worded as follows: "Not the least significant of the entrance of the private hospital into this public health field, is the number which receive smallpox, a situation which seems to presage the doom of the pest house."

While an isolation hospital does not need to provide accommodation to any great extent for measles, chickenpox, mumps and whooping cough, of which usually too limited a number will apply for hospital treatment to make it necessary to provide special wards for their reception, the responsibility nevertheless exists to provide for an occasional case of these diseases. Many young men and women of our cities live as individuals in hotels or rooming houses, the latter of which afford no means of getting meals or food on the premises. Because of this and of the impossibility of obtaining proper treatment or isolation of cases of the minor infections, which not infrequently develop among young adults who have not developed immunity through having them in infancy, the absolute necessity exists of removing them to a hospital, and the only hospital which can or will receive them is an isolation hospital. For such individual cases a series of small wards should be available and all the necessary precautions taken to prevent cross infection by



Careful nursing and the practice of medical asepsis. The ideal hospital, which on account of excessive cost of construction and maintenance would seem to be unattainable in smaller cities, would necessitate the provision of a separate ward for each patient on admittance in which he could be kept a sufficiently long time to cover the incubation period of any other disease he might possibly be incubating at the time of admission. This alone would prevent or reduce to a minimum the possibility of cross infection. Usually too limited a number of such individual wards are available, as is the case at our Edmonton hospital, to make it possible to carry out this period of detention in single wards except in a minority of cases. The six wards we have have proved to be very useful in treating the odd case of erysipelas or isolating any case where the diagnosis has not been definitely established. A considerably increased number of these detention wards in the construction of this otherwise admirably designed and efficient hospital would have more closely approximated to the ideal suggested.

Time will not permit of going into details as to the construction or management of isolation hospitals. Suffice it to say that cross infection is now controlled and prevented by following out the well-known routine of medical asepsis as practised in modern hospitals with the emphasis on personal contact as the chief cause of communication of disease, and a careful technique and strict discipline as applied to the nurses, physicians, attendants and employees.

In some cities the hospital for communicable diseases is under the control of the medical officer of health and operated independently of other hospitals. This does not commend itself either as an economical method or as likely to give the best service. In Edmonton the best type of co-operation between health departments and hospitals is in operation since the management of the isolation hospital has been transferred to the city-owned general hospital, the Royal Alexandra. The advantages of this form of co-operation and the general principles which should govern both parties to it are so well expressed in the report of the committee of the American Public Health Association referred to, that I take the liberty of quoting from it as follows:

"The utilization by health departments of private general hospitals for the care of acute communicable diseases is now recognized as a sound policy which holds advantages for both groups. For the health department these are chiefly:

1. The economy in the cost of controlling disease.
2. The provision of better service.

The hospital derives advantage from the arrangement due to,

- (a) the broader service it can offer internes; (b) the student nurses being able to receive desirable experience in this special field at their own institution instead of being sent to other hospitals; and (c) payment from public funds for patients with communicable diseases who are unable to pay or are hospitalized against their will.

"The numerous and successful instances of co-operation in this field

suggest their desirability and community value. In the development of such programmes, it should be recognized that in the hospitalization of communicable disease, the responsibilities of the health department relate primarily to approval of quarter, equipment, etc., and to the admission and release of patients, but do not extend to administrative responsibility within the hospital." For satisfactory co-operation, therefore, the responsibility for admission and release of patients must necessarily rest with the health department, which, however, exercises no direct authority in the internal administrative control which is the function of the hospital authority. On the other hand, the health department must depend on the hospital authority to provide adequately for all cases of communicable disease where hospitalization is necessary.

Further advantages of co-operation of health departments and hospitals are suggested in this committee report, where the health department obtains laboratory service from the hospital or the reverse where the hospital uses a health department laboratory equipped and provided by the municipality. In Edmonton at the various large general hospitals, fully equipped laboratories are provided, but only that of the municipally-owned Royal Alexandra Hospital is utilized to the extent of handling the laboratory work of the patients treated in the Isolation Hospital attached. For many years the health department has been utilizing the service supplied by the provincial laboratory of the University of Alberta.

Another form of co-operation between health departments and hospitals is the establishment of clinics at the latter. The simplest form of co-operation is where the hospital furnishes the quarters and equipment while the health department provides some or all of the medical, dental, nursing or clerical service. There may be complete control of the clinic by the hospital, with the health department merely co-operating in public health relations or assisting by a financial subsidy, to the other extreme where the hospital furnishes only the quarters and the health department provides everything else, including service, drugs, etc. Such co-operation is at the present time confined to the larger cities, where fully organized health departments are established and large well-equipped hospitals exist. In Edmonton the necessities of the situation are sufficiently well met at present through the operation in the down town area of the provincial clinic which is carried on under the supervision of the University Hospital staff. To this clinic the city of Edmonton makes an annual grant of \$100 towards the upkeep of the dispensary which supplies medicines for relief cases.

In conclusion I desire to emphasize the necessity of co-ordinating for public service all the health agencies at work in our communities. All petty rivalries should be eliminated and co-operation, continuous, not sporadic, voluntary, not compulsory, should be, for mutual advantage, the goal of our attainment.

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# Rabies in Essex County, Ontario

## REPORT OF A FATAL HUMAN CASE

F. ADAMS, M.B., D.P.H.

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ACCORDING to Rice and Beatty<sup>1</sup>, rabies is on the increase in the United States, and those States bordering on old Ontario are badly infected.

The Department of Health of Detroit, Michigan, has been seriously concerned with the rabies situation in that city ever since 1924. The Detroit Department of Health is one of the best organized on the continent, and for years back has been putting forth every effort to control rabies. There is an exceedingly difficult situation with which to deal. Not only is Detroit a big city of about a million and a half, but it is growing very rapidly, has many independent communities on its borders, and the population of Greater Detroit is of many racial origins. Over 50 per cent of the population of Detroit has a mother tongue other than English. The following table shows the number of proven cases of rabies in Detroit from the beginning of 1921 to the end of May 1928.

| POSITIVE CASES OF RABIES IN DOGS IN DETROIT, MICHIGAN, U.S.A. |                         |
|---|-------------------------|
| Year  | Cases of rabies in dogs |
| 1921  | 30                      |
| 1922  | 21                      |
| 1923  | 33                      |
| 1924  | 210                     |
| 1925  | 93                      |
| 1926  | 89                      |
| 1927  | 265                     |
| 1928 (First 5 months)   | 302                     |

Intercourse between Michigan and the Border Cities on the Canadian side is of the freest possible character. Many thousands of persons go back and forth across the border daily. Week-ends and holidays, many thousands of United States motor cars cross into Canada. A great many Detroiters have summer cottages on the Canadian side of Lake Erie. In connection with this great traffic back and forth, dogs are brought in motor cars in both directions without any serious attempt at control by the immigration or customs authorities on either side of the river. The passing back and forth of dogs is just about as free and uncontrolled as the passing back and forth of automobiles and human beings.\*

Essex County, Ontario, was free from known rabies for several years up to June 1926, when a dog came down with the disease in Malden township. The origin of the infection was not discovered, but in view of the prevalence of rabies in Michigan and the great traffic across the border, an United States origin is strongly probable.

<sup>1</sup>American Journal of Public Health.

The first case of rabies in the Border Cities proper occurred in May 1927. The dog affected was a small dog of the lap dog type, kept in the house a great part of the time, and the source of the infection could not be traced.

Following the occurrence of an actual case of rabies in the Border Cities proper, the local Board of Health for the Essex Border Municipalities met and took prompt action. Letters were sent out at once to the various municipal councils urging the tying up of all dogs and the impounding and destruction of all dogs found loose on the street. Letters were sent out also to all the medical officers of health in Essex county advising them as to what we were doing and suggesting similar action on their part. A letter was also despatched to the collector of customs, Windsor, (a Dominion Government employee), asking him to instruct his officers at Windsor and Walkerville to inform persons bringing dogs across on the ferries in motor cars that such dogs had to be securely chained or otherwise confined on their own premises during their stay here.

Following the above communications the control of dogs in the Border Cities proper has been fairly effective. In 1927, 1,541 dogs and cats were disposed of at the Windsor incinerator alone. The effectiveness of control has been by no means one hundred per cent. Some dogs may still be seen running loose on our streets. The Board of Health has never been satisfied that sufficient dog catchers were appointed or that the police have been sufficiently enthusiastic in enforcing the law and prosecuting offenders.

As far as the rest of the county is concerned, action was taken in some townships, but not in all. Townships directly adjacent to the Border Cities with considerable populations, residing mostly in "shack towns," have failed to control dogs in any effective way.

As regards dogs coming into the country in motor cars on the ferries, we have no reason to believe that any effective action was taken following our letter to the local collector of customs.

Since June 1927 the local press has repeatedly printed articles on rabies, outlining the situation from time to time and giving the necessary facts as to the transmission of the disease, etc. It was hoped that this publicity would result in all bites or other injuries from possibly rabid animals being reported. Since June 1927 up to the present time approximately sixty dogs are known to have died in the Border Cities of rabies and about fifty people have taken rabies treatment. Of the persons treated none have developed rabies.

On June 16th, 1928, a cat, which was acting strangely and had bitten a boy who had disturbed it, was killed and the brain was examined in the Laboratories of the Ontario Department of Health at Toronto. It proved to be a case of rabies. Since then, up to the time of writing, (August 4th, 1928), two other proven cases of rabies in the cat have occurred in the Border Cities. During 1928 to date Detroit also reports three rabid cats and one rabid fox.

## A FATAL HUMAN CASE OF RABIES

Somewhere about the first of June 1928 a little girl, L.G., age 4, while playing, picked up a cat and was bitten or scratched by the animal on the left temple. (Seen about two months later the scars of the wound had the appearance of bites rather than scratches.) The wound was treated at the time with iodine and the injury was not reported to the board of health, possibly because up to that time newspaper publicity had been focused mainly on dog bites. About two months later the child took ill and the course of the illness was as indicated below.

Saturday, July 21st. Feverish; nervous; drowsy at times; eyes described by the parents as staring.

Sunday, July 22nd. Still feverish and drowsy; not irritable; eyes as before; taking liquids without difficulty.

Monday, July 23rd. Getting worse; does not sleep; irritable; chokes and cries on attempting to take liquids; eyes wide open and staring; fever continues.

Tuesday, July 24th. Condition becoming worse; more irritable; no twitching recognized; cannot drink; exceedingly restless.

The parents were unable to keep the child in bed nor would she permit them to carry her about in their arms. The patient walked about the house all night and the distracted parents went about with her to protect her from injury.

Wednesday, July 25th. The patient, now exceedingly ill and apprehensive, was sent into hospital and after a short period became unconscious and died. Lumbar puncture yielded a clear spinal fluid with no increase in cell count or globulin.

*Postmortem findings.*

Chest and abdomen negative. The brain, submitted to the Laboratories of the Ontario Department of Health, showed the microscopic changes typical of rabies. Rabbits inoculated with portions of the brain, showed the typical symptoms, died, and negri bodies, the microscopic diagnostic picture of rabies, were demonstrated in their brains.

## THE ADMINISTRATIVE CONTROL OF RABIES

*Authority.*

The power to prevent the importation of rabies lies with the Dominion authorities.

The duty of a medical officer of health under the Regulations of the Ontario Department of Health begins with the biting of a human being by an animal suspected of having rabies. The medical officer of health is required to have the animal secured and kept under observation for ten days. If the animal dies or is killed, the head must be sent to the laboratories of the provincial department for examination. If the final decision is that the



animal was suffering from rabies, then the medical officer of health is to arrange Pasteur antirabic treatment for those bitten.

The power to pass by-laws to control dogs, establish pounds, appoint dog-catchers, pound-keepers, etc., lies with the municipal councils.

The foregoing division of authority is certainly not conducive to effective rabies control. Frequently absurd situations develop. One municipality takes proper action and a neighbouring municipality takes none. We had such a situation in the Border Cities. On one side of a boundary street all dogs were required to be securely tied. On the other side of the street they ran at large. As far as density of human or dog population is concerned, both sides of the street are pretty much alike.

It would seem to be a fundamental necessity that some strong central authority should come into a threatened district and see that uniform action is taken over the whole danger area.

#### *Public Opinion.*

It is generally recognized that for the successful enforcement of any regulation or law there should be a decided majority of public opinion behind it. In regard to rabies, the control of dogs, etc., public opinion is a much divided affair. At one extreme are many people who believe that the keeping of dogs, cats, etc., should be prohibited in cities. At the other extreme is the man who believes the average dog more loyal and intelligent than the average human being and is prepared to resist any restraint whatever as applied to his dog.

As regards the disease, rabies itself, the general public are in possession of the most fantastic ideas and misinformation. Many persons appear to look on rabies as insanity in dogs and do not seem to be able to grasp the idea that it is essentially an infectious disease of the nervous system. Their idea of symptoms of the disease in dogs is most extraordinary. I have known children to be allowed to take a sick pet dog suffering from rabies to bed with them. In the presence of an epidemic many people consider any abnormal action on the part of a dog as sure proof of rabies. On the other hand, there are people who flatly deny the existence of any such disease. Breeders of valuable dogs, members of official kennel clubs, etc., are usually well informed in regard to the disease and in favour of measures to control and stamp it out.

In every community there is bound to be a certain number of cranks who are apt to band themselves together and make themselves felt in the community to a degree much beyond their numbers. Controversy is "news" and these people have no difficulty in having their views published in the press. The general public reads carelessly and is not apt to differentiate between the utterances of a person who might, by training, have knowledge whereof he speaks and the person who has no training whatever. Most of these controversialists have never seen a case of rabies, know nothing of either gross or microscopic human or canine anatomy, have no training in infectious diseases and their various methods of transmission, have never looked through



a compound microscope; in short, have no training whatever that would enable them to understand a disease such as rabies. These people are entitled to a prejudice, which they have, but they are not entitled to an opinion which should be based on sound knowledge. However, as already stated, they have no difficulty in getting their views printed in the newspapers. The result of all the foregoing is that public opinion as regards rabies and its control is a confused, incoherent, uncrystallized hodge-podge that is utterly useless for the "backing up" of measures to control the spread of the disease.

It would seem that something in the way of a campaign of public education by a sound central authority might serve a useful purpose in creating a background for rational measures against the spread of rabies.

#### CONCLUSIONS

1. The control of rabies is difficult. There is no useful public opinion behind the ordinary measures of control. Divided authority is an administrative difficulty.

2. The rabies situation in the United States being what it is, some action on the part of the Dominion Government to protect the provinces against importation of the infection, would appear to be in order.

3. Pasteur antirabic treatment administered soon after infection would appear to be a practically certain preventive against the development of the disease.

4. While dogs represent the great reservoir of infection in rabies, other animals such as cats cannot be disregarded and may constitute a danger.

5. Human cases are so unusual and indefinite in their symptomatology that an incorrect diagnosis may easily be made. It is important to be vigilant and to prove suspicious human cases by postmortem and microscopic tests and possibly by inoculation of laboratory animals.

#### *Acknowledgments.*

The writer wishes to gratefully acknowledge the great assistance he has received in the control of rabies in the Essex Border Municipalities from the veterinarian in charge of the local station of the Health of Animals Branch of the Dominion Department of Agriculture; the officials of the Detroit Department of Health; many members of the municipal councils, the police magistrates, the police, the press and many private citizens.

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# Further Studies on Transfer of Infection by Handshakes

HELEN M. MATHEWS, M.A.\*

**I**N a previous article<sup>1</sup> on this subject, (1926) it was shown that organisms, both non-pathogenic and pathogenic, are readily transferred from one hand to another in handshaking.

We wished to determine how far such transferred infection would pass in subsequent handshakes; therefore further experiments were carried out in the following manner:—

*Experiment Outline*—Culture of *B. prodigiosus*—2 days at room temperature.

1. All hands washed with soap and water; hands 2 and 3 dried with paper towelling.
2. Hand 1, ("give hand") smeared with emulsion of *B. prodigiosus* in sterile saline.
3. Swabs taken of hands 2 and 3 for absence of *B. prodigiosus*.
4. Shake hands 1 and 2. (Hand 2 was "take-hand" here.)
5. Shake hands 2 and 3. (Hand 2 was "give-hand" here.)
6. Swab hand 2 for *B. prodigiosus*.
7. Swab hand 3 for *B. prodigiosus*.

Thirty handshakes, as above, were made in ten different experiments. The differences in the experiments were due to different kinds of handshakes and the condition of the hands—dry or moist. The swabs were smeared on nutrient agar incubated at 21° C. for 2 days.

CHART I

| Date    | Age of culture | Hand 1. | Hand 2. | Hand 3. | Shake 1.  | Shake 2.             | Hand 2.                  | Hand 3. |
|---------|----------------|---------|---------|---------|-----------|----------------------|--------------------------|---------|
| May 23  | 2 days         | dry     | dry     | dry     | ordinary  | ordinary             | p,f,t,b                  | p,f,t.  |
| May 27  | 2 "            | moist   | dry     | dry     | prolonged | ordinary             | p,f,t,b                  | p,f,t.  |
| May 30  | 2 "            | dry     | moist   | moist   | ordinary  | ordinary             | b.                       | f.      |
| June 1  | 2 "            | dry     | dry     | moist   | hearty    | hearty               | p,f.                     | f.      |
| June 6  | "              | moist   | dry     | dry     | ordinary  | down towards fingers | p,f,t,b.                 | p,f,b.  |
| June 8  | 2 "            | dry     | moist   | dry     | ordinary  | ordinary             | p,f.                     | p.      |
| June 10 | 2 "            | dry     | moist   | dry     | hearty    | hearty               | p,f.                     | f.      |
| June 15 | 3 "            | dry     | moist   | moist   | ordinary  | ordinary             | p,f,b.                   | p,f,t.  |
| June 20 | 3 "            | dry     | dry     | dry     | limp      | limp                 | B. subtilis from Hand 1. |         |
| June 22 | 2 "            | dry     | dry     | dry     | limp      | limp                 | p.                       | f.      |

p—palm. f—fingers. t—tips of fingers. b—back of hand.

\*From the Department of Bacteriology, the University of British Columbia, Vancouver, B.C.

In every case, (9 out of 10) except that of June 20, *B. prodigiosus* was transferred to the third hand. The agar cultures from June 20 were covered with colonies of a heavy growing spore former, probably *B. subtilis*, which apparently inhibited the growth of *B. prodigiosus*. To test this out, a tube of agar was smeared with a fresh culture of *B. prodigiosus* and then with a fresh culture of *B. subtilis*. There was a good growth of *B. subtilis* in 24 hours, but it was a week before the *B. prodigiosus* showed.

As will be noticed if the technique of handshaking is studied carefully, organisms are transferred when the fingers of Hand 1 rub on the back of Hand 2, and then are transferred from the back of Hand 2 to the tips of Hand 3. This is shown to some extent in the experiments listed above. *B. prodigiosus* was often found on the back of Hand 2 and on the tips of Hand 3. It seems to make little difference whether the hands are dry or moist, although there is a slightly higher transfer in the dry to dry, or moist to dry, (i.e. when the "take" hand is dry), than in dry to moist, or moist to moist, (i.e. when the "take" hand is moist). This agrees with the 1926 series. Another factor that appears not to influence transfer is the kind of handshake whether hearty, ordinary or limp. This also agrees with the series of 1926. With handshakes of different kinds and hands of different dampness, there was transfer of *B. prodigiosus* during every handshake.

As there had been transfer to the third hand, in 9 of 10 handshakes, the next question that presented itself was how far would transfer take place. Therefore on October 31st, 1927, a series of experiments was started, using the same technique as in the last set, but having 5 handshakes. In the 4 (experiments) there was transfer to the 3rd in all four, to the 4th hand in three and to the 5th in two.

CHART II

| Experiment No. | Hand 3. | Hand 4. | Hand 5. |
|----------------|---------|---------|---------|
| 1              | p,f,b.  | p,f,b.  | p.      |
| 2              | p.      | p,f.    |         |
| 3              | f,b.    |         |         |
| 4              | p,f,b.  | p.      | p.      |

p—palm. f—fingers. t—tips of fingers. b—back of hand.

In Experiment 1, there was a large number of *B. prodigiosus* colonies on the agar swabbed from the palm and fingers of the 3rd hand, but not as many on the back. On the cultures from the 4th hand there was more on the agar swabbed from the back than on that from the palm or fingers, showing again that transfer often takes place from the fingers of one hand to the back of another hand and again to the fingers of the next hand. As both children and adults have their fingers on their faces and in their mouths often during each day, this is a possible method of spreading disease.

A related experiment was tried to see if the hands were freed from bacteria with washing with soap and water and drying on a towel.

The technique was as follows:—

1. Saline emulsion of 2 day old culture of *B. prodigiosus*.
2. Smear left hand with emulsion—let dry in air.
3. Swab right hand for absence of *B. prodigiosus*.
4. Wash hands well in water in basin—basin and water sterilized together and allowed to cool in autoclave before washing—liquid soap.
5. Dry on sterile towel.
6. Swab both hands for *B. prodigiosus*.
7. Swab towel.

The swabs were all smeared on nutrient agar slants and incubated for 48 hours at 27° C. Three loopsful of the wash water were put, in duplicate, into sterile broth and incubated for 48 hours at 27° C.

After 48–72 hours *B. prodigiosus* colonies showed on the media cultured from:—1. left hand after washing—palm—fingers 3, 4 and 5, tip 2, back. 2. towel. 3. water.

This was followed by an identical experiment with the exception that the hands were washed lightly.

After 48–72 hours *B. prodigiosus* colonies showed on the media culture from:—1. left hand after washing—palm. 2. towel. 3. water.

It will be noticed that:—1. *B. prodigiosus* was still on the left hand after washing both well and lightly with soap and water and drying on a towel. 2. *B. prodigiosus* was not transferred to the right hand. 3. *B. prodigiosus* was found on both towels. 4. *B. prodigiosus* was found in the water.

#### SUMMARY

These experiments show that bacteria are transferred from one hand to another during handshaking, sometimes to the fifth person; thus the handshake is a method of spreading disease. As the fingers are the part of the hand that usually touch the mouth, they are more active than the rest of the hand in transferring disease. As was shown above, the fingers of the first hand infect the back of the second; the back of the second hand infects the fingers of the third, and so on. Therefore the "take" hands in the odd numbered handshakes are likely to have the infective material on the fingers and therefore the hand of the third person is likely to be more dangerous to himself than the hand of the second person is to himself; but the hand of the second person is more dangerous to those with whom he shakes hands than the hands of the third person.

If, as shown above, transfer of infection is made to the third, fourth or fifth person, there would be a large widening of the range of infection from a patient or "carrier" as the infected person might, by shaking hand, infect those with whom he shakes hand, and these in turn infect others to the third, fourth or fifth degree.

<sup>1</sup> "Transfer of Infection by Handshakes". Hill & Mathews. Pub. Health Jour. Vol. XVII, p. 347.

# Winnipeg---The Convention City

OCTOBER, 11th-13th, 1928

The Association Headquarters will be at the Royal Alexandra Hotel. The various sessions of the conference will be held in the hotel. The Royal Alexandra is conveniently situated and immediately adjoins the C.P.R. Station. The hotel is one of the finest in Canada and is under the management of the Canadian Pacific Railways. Reservations should be made directly with the hotel at as early a date as possible.

## *Railroad Fares to Winnipeg*

A special return trip rate of a fare and one-half is available for *travel wholly in Canada* from any point, if ten members will arrange to purchase their tickets at one time. In this case it is necessary for them to leave on the same train but it is not necessary for the party to return on the same train. Such a group of ten need not be from one city, but



CONVENTION HEADQUARTERS—  
ROYAL ALEXANDRA HOTEL WINNIPEG, MAN.

may join the party at the nearest point in the district. Thus members from Windsor, Hamilton, Ottawa and Kingston may form a group with those from Toronto. Questions regarding further details in the arranging of groups in the East may be sent to Dr. J. T. Phair, General Secretary of the Association.

For those desiring to attend the meeting of the American Public Health Association in Chicago, which meeting immediately follows our Winnipeg sessions, namely from October 15th-19th, a round-trip ticket can be purchased from points east of Winnipeg, permitting of return by way of Chicago. The extra charge for this routing is \$5.00.

The following are fares from certain cities:

|                               |         |          |
|-------------------------------|---------|----------|
| Montreal to Winnipeg (return) | \$86.40 | + tax 1% |
| Quebec                        | "       | 86.75 "  |
| Ottawa                        | "       | 80.80 "  |
| Toronto                       | "       | 76.60 "  |
| Regina                        | "       | 22.15 "  |
| Edmonton                      | "       | 49.50 "  |
| Vancouver                     | "       | 95.75 "  |

Round trip Toronto, Montreal, Ottawa or Quebec to Winnipeg, returning via Chicago, \$5.00 extra.



## PRELIMINARY PROGRAMME OF SESSIONS

Registration commences Thursday, October 11th, 9.30 a.m.

**FIRST SESSION**

Thursday, October 11th, 10.30 a.m.

**PUBLIC HEALTH NURSING SECTION**

*Chairman: Miss Jean E. Browne, Director, Junior Red Cross,  
Canadian Red Cross Society*

*Chairman's Address—Miss Jean E. Browne.*

*The Teaching of Health in Normal Schools—Miss Rae Chittick, Calgary  
Normal School, Calgary.*

*The Teaching of Health in Elementary Schools—Miss Elizabeth Russell,  
Director of Public Health Nursing, Department of Health and Public  
Welfare, Province of Manitoba, Winnipeg, Manitoba.*

*The Teaching of Health in High Schools—Miss E. M. Simpson, Director  
of School Hygiene, Regina, Saskatchewan.*

*The Teaching of Health in the Home—Miss Edith B. Hurley, Professor  
of Public Health Nursing, University of Montreal, Montreal, Que.*

**LABORATORY SECTION**

Thursday, October 11th, 10.30 a.m.

*Chairman's Address—Professor G. B. Reed, Queen's University, Kingston.*

*The Effect of Temperature Variations on Viability of Vaccine Virus—  
Dr. N. E. McKinnon, Connaught Laboratories and School of Hygiene,  
University of Toronto.*

*Further Observations on the Reaction Following the Intradermal Injection  
of Smallpox Virus—Dr. N. E. McKinnon and Dr. R. D. Defries,  
Connaught Laboratories and School of Hygiene, University of Toronto.*

*The Diagnosis of Undulant Fever by Agglutination—Dr. E. McNabb,  
Bacteriologist, Dept. of Health of Ontario, Toronto.*

*Variation in the Fish Larvae of Diphyllbothrium Latum—Dr. Daniel  
Nicholson, University of Manitoba.*

*Microbic Dissociation in Tubercle and Related Bacilli—Dr. Guilford B.  
Reed, Queen's University.*

*B. Welchii Toxemia and Pernicious Anaemia—Dr. J. H. Orr, and Dr.  
Guilford B. Reed, Queen's University.*

**SECOND SESSION**

Thursday, October 11th, 2.30 p.m.

*Dangers of Unpasteurized Milk*—Dr. N. MacLeod Harris, Chief of Laboratory of Hygiene, Dept. of Pensions and National Health, Ottawa.

*Bovine Infectious Abortion in Canada and Its Relationship to Public Health*—Dr. C. A. Mitchell, Health of Animals Branch, Dept. of Agriculture, Ottawa.

*The Prevalence and Extent of Bovine Tuberculosis in Canada as Indicated by the "Restricted Area Plan" of Tuberculin Testing*—Dr. A. E. Cameron, Chief Inspector, Division of Animal Husbandry, Dept. of Agriculture, Ottawa.

*Some Unsolved Problems in Preventive Medicine*—Dr. M. R. Bow, Deputy Minister of Public Health, Edmonton, Alta.

*Rural Sanitation*—T. J. Lafrenière, C.E., Chief Sanitary Engineer, Provincial Bureau of Health of Quebec, Montreal.

**THIRD SESSION**

Thursday, October 11th, 8.30 p.m.

Meeting in association with the Winnipeg Health League, Theatre "A", University of Manitoba

Chairman—Dr. H. M. Speechly, President of the Winnipeg Health League

*Address of Welcome*—Hon. Dr. E. W. Montgomery, Minister of Health and Public Welfare, Manitoba.

*Address of Welcome*—Dr. A. J. Douglas, Medical Officer of Health, Winnipeg.

*Presidential Address*—Dr. George D. Porter, Toronto.

*Address*—Dr. W. J. Bell, Deputy Minister of Health, Ontario.

**FOURTH SESSION**

Friday, October 12th, 9.30 a.m.

*A Public Health Nursing Programme for a Community of 5,000*—Miss Nann McMann, Supervisor, Western Division, Victorian Order of Nurses, Winnipeg.

*The Authority of the Medical Officer of Health in His Own Community*—Dr. A. Wilson, Medical Officer of Health, Saskatoon, Sask.

*Paper (Title to be announced)*—Dr. C. N. Laurie, Medical Officer of Health, Port Arthur, Ont.

*Report of Committee on Quarantine Regulations*—Dr. Fred Adams, Medical Officer of Health, Windsor, Ont.

Discussion to be opened by Dr. Roberts, Medical Officer of Health, Hamilton, Ont.

*Rural School Hygiene*—Dr. J. T. Phair, Chief, Division of Child Hygiene, Provincial Department of Health, Toronto.

*Milk—Inspection and Control*—Mr. R. H. Murray, B.A.Sc., Dept. of Public Health, Regina, Sask.

*The Outbreak of Poliomyelitis in Alberta, 1927*—Dr. Jenkins, Provincial Department of Health, Edmonton, Alta.

Friday, 1.00 p.m.

Complimentary Luncheon tendered by the Mayor and Council of the City of Winnipeg to the members of the Canadian Public Health Association.

**FIFTH SESSION**

Friday, October 12th, 3 p.m.

*Full-Time County Health Units in the Province of Quebec*—Dr. Alphonse Lessard, Director, Provincial Bureau of Health, Quebec.

*The Movement Toward Full-Time Health Units in Saskatchewan*—Dr. F. C. Middleton, Acting Deputy Minister of Public Health, Regina, Sask.

*British Columbia's Full-Time Health Units*—Dr. H. E. Young, Provincial Health Officer, Victoria, B.C.

*Further Progress in New Brunswick*—Dr. G. G. Melvin, Provincial Medical Officer of Health, Fredericton, N.B.

*Discussion.*

Friday Evening, October 12th

Reception at the Parliament Building tendered by His Honour, Theodore Burrows, the Lieutenant-Governor of Manitoba.

**SIXTH SESSION**

Saturday, October 13th, 9.30 a.m.

*Group Instruction of Mothers in the Health Centre*—Miss Edith Fenton, Superintendent, Dalhousie Health Centre, Halifax, N.S.

*The Wasserman Test—A Comparative Study of the Findings in Different Laboratories*—Dr. C. P. Fenwick, Canadian Social Hygiene Council, Toronto. Dr. D. T. Fraser, Connaught Laboratories and School of Hygiene, University of Toronto.

*The Possibilities and Limitations of Special Training for Sanitary Officers*—Alex. Officer, Dept. of Health, Winnipeg.

*Recent Advances in Serums and Vaccines*—Dr. R. D. Defries, Connaught Laboratories and School of Hygiene, University of Toronto.

*Periodic Health Examination*—Dr. Coolidge, Metropolitan Life Insurance Company, Ottawa.

*The Contribution of Canadian Insurance Companies to Periodic Health Examination*—Dr. H. C. Cruikshank, the Manufacturers' Life Insurance Company, Toronto.

*The Food and Drugs Act and Its Administration*—H. M. Lancaster, M.A.Sc., Chief, Division Food and Drugs, Dept. of Pensions and National Health, Ottawa.

**SEVENTH SESSION**

Saturday, October 13th, 12.15 p.m.

*Business Meeting of the Association.*

*Report of Secretary.*

*Report of Treasurer.*

*Report of Executive Council Concerning the Acquiring of the Public Health Journal.*

# Editorials

## EARLY DIAGNOSIS

A HEALTH worker attending the Canadian Medical Association Annual Meeting was impressed with the fact that prevention and early diagnosis formed the basis of so many of the papers presented and the discussion arising out of them. It would be difficult to imagine a more convincing set of arguments in favour of periodic health examinations than those which were presented with regard to the need for early diagnosis under the subjects which were dealt with by the various speakers. There was no question of the need and value of early diagnosis, but there remained the evident fact that comparatively few persons would consider that they were ill or even on the high road to a severe illness when they experienced these early symptoms. As long as it is left to the laymen to decide that they require medical care, just so long will there be but few of them who will present themselves for examination in the early stages of disease. There is a practical hope that if all persons would come regularly for examination when they themselves think they are well, a very large percentage of disease would be diagnosed early and so would be properly and adequately treated. Otherwise, we fear that the subject of early diagnosis will remain a nice one for medical meetings to discuss, but that it will not be of much benefit to the public, because the medical profession will not have the chance to practise it.

## THE COST OF SICKNESS

PUBLIC health workers must view with interest the creation of the Committee on the Cost of Medical Care in the United States. This Committee has before it a programme of studies which, it is anticipated, will include, when completed, a fair presentation of the extent of sickness in the country, the cost of sickness to the family, the cost of hospitals and clinics, the subject of pay and group clinics, and the services provided by the State.

The cost of sickness is important from the health standpoint because it is of importance that prompt, adequate treatment be available for all, irrespective of economic conditions. This is evident because such treatment is, in many cases, preventive of more serious conditions and because it returns



the individual to normal health. There is another side to the question, which is, that health work should be presented to the public as a measure of health insurance to the community and to the individual. Few persons realize the comparatively large amount of money that is spent, or that should be spent, by the average family for sickness. Not all sickness is preventable, but much of it is. If the expenditure of one or two dollars per capita by the population can be shown to provide a considerable measure of protection from sickness—and we believe that it can be shown—should not the health worker keep this fact before the public, and before the municipal, provincial and federal governments?

### OUR RESPONSIBILITY

THE Canadian Public Health Association was organized in 1911, and the first annual meeting, under the presidency of Dr. T. A. Starkey, was held in the city of Montreal in the fall of that year. This meeting laid well the foundations, and little change has had to be made in the constitution and by-laws of the Association, which were adopted at that meeting.

The seventeenth annual meeting, which will be held in Winnipeg from October 11th to 13th, will take the form of a conference in order that greater time may be given to the discussion, not only of important public health problems, but of the affairs of the Association. During the past year the Executive Committee, acting under instructions from the last annual meeting, have taken the necessary steps, which, it is hoped, will result in the various provincially-organized Health Associations becoming closely identified with the Association. At the recent meeting of the Ontario Health Officers' Association action was taken in conformity with this plan, and, as a result, every health officer in Ontario has become a member of the Canadian Public Health Association.

During this year, also, initial steps were taken to acquire the PUBLIC HEALTH JOURNAL. A joint editorial board was appointed, and the Journal has been edited and managed by this board since January. The general business of the Association has, during all the years, been carried on by officers elected at the annual meetings, who have gladly given their services. No officer has been paid for his services.

The question of the complete acquisition of the Journal rests with the annual meeting, and the further development of its possibilities and the appointment of several new committees to study important public health problems call for further enlistment of the time of our members. It is hoped, therefore, that every member will consider carefully the call for support, not only of the Winnipeg meeting, but of the work of the Association during the coming months.

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# EPIDEMIOLOGY AND VITAL STATISTICS

A. C. JOST, M.D., AND NEIL E. MCKINNON, M.B.

## AN ANTI-TUBERCULOSIS DEMONSTRATION IN SWEDEN

MANY persons do not know that there has been carried on in Sweden for a number of years an Anti-tuberculosis Demonstration, and that there is now available the most interesting and instructive report of the results which have been there met.

The demonstration area consists of four larger and several small towns or villages in the district of Neder-Lulea, county of Norbotten, a county on the Gulf of Bothnia in Sweden. The total population of the district in 1906, when the first examinations were made, was 1,860. An examination, made at that time, and checked by a re-examination made two years later, indicated that there were then 169 persons who gave undoubted evidence of tuberculous pulmonary disease, while 69 more gave doubtful evidence of this infection. It was later determined that 30 of the 69 were actually tuberculous. There were in addition 33 other persons the victims of tuberculous disease, not pulmonary.

Situated far to the northward, there are but three hours of each day, when in the winter time the sun is above the horizon. In summer, on the contrary, the sun is below the horizon only one and one-half hours each day. The population consists largely of tillers of the soil, and the women do an extremely large portion of the labour, both in the home and in the

cow barns. It can safely be assumed that they are not of the class which find sanatorium or hospital changes relatively easy to bear. The homes are small, and at least during the winter months, the entire family live, eat and sleep in one room. A characteristic piece of furniture, some years ago, now seldom seen since it was especially enveigled against, was the cupboard bed, a contrivance, double decked and fitted with close doors, which was used by the entire family for sleeping quarters.

The demonstration was at first intended not to be prolonged beyond several years, though it has been carried on to the present time, a period of about twenty years from its commencement. The programme of the demonstration included the acquisition of a building for examinations and for treatment; free examinations by the physicians with home instructions and follow up work by a staff of nurses; the provision of treatment facilities in an institution, or the supervision of treatment at home if necessary, all being free; educational work by the physician and staff; assistance by the Institute if structural change in the home was advised by the physician, and was not within reach of the householder; the removal of children from contact with persons in the active stages of the disease, and the provision of free bathing facilities for consumptives and their families.

At the time of the preparation of the Report (1926) the population of the area was much the same as it was when the demonstration first started (363 families in 1926 against 355 in 1908).

From these families there were examined in 1906, 1,652 persons, of whom 199 were tuberculous, or about 12 per cent of the population. In 1926, there were examined from 363 families, 1,834 persons, of whom 147 were tuberculous, or about 8 per cent. This indicated that there had been much improvement, an amount which, taken in consideration with still other evidence, intimates that there was in the district a diminution in the prevalence of tuberculosis, which amounts to about 25 per cent. This is especially valuable, since figures are given which indicate that during the period, there was an actual increase of tuberculosis in that portion of Sweden contiguous to and immediately surrounding the demonstration area.

## POLIOMYELITIS

THE table below shows that no less than nine cases of poliomyelitis in Manitoba and ten cases in British Columbia were reported in the month of July. In 1927 neither of these provinces reported any poliomyelitis in July. This very definite increase over the normal strongly supports the prediction that 1928 will be a "polio year". Physicians and health officials generally throughout the Dominion cannot but take these figures as a warning of what may follow. Besides avoiding gatherings or crowds in which there is a greater possibility of coming into contact with those harbouring the germ, the importance of stiffness of the neck as an early sign, and the treatment value of convalescent serum given intraspinally should be remembered. Arrangements should be made, therefore, for the obtaining of serum from convalescent patients.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA  
BY PROVINCES—JULY, 1928

| Diseases                      | Nova<br>Scotia | New<br>Brunswick | Quebec | Ontario | Mani-<br>toba | Saskat-<br>chewan | Alberta | British<br>Columbia |
|-------------------------------|----------------|------------------|--------|---------|---------------|-------------------|---------|---------------------|
| Diphtheria...                 | 13             | 19               | 125    | 155     | 69            | 11                | 15      | 66                  |
| Scarlet Fever..               | 24             | 39               | 141    | 148     | 79            | 37                | 59      | 45                  |
| Measles.....                  | 89             | 9                | 139    | 903     | 377           | 82                | 42      | 62                  |
| Whooping<br>Cough.....        | 14             | —                | 14     | 218     | 28            | 4                 | 7       | 12                  |
| German<br>Measles.....        | —              | —                | *      | 4       | *             | 2                 | 3       | 3                   |
| Mumps.....                    | 2              | —                | *      | 295     | 11            | 18                | 13      | 19                  |
| Smallpox.....                 | —              | —                | 81     | 18      | 4             | 11                | 4       | 39                  |
| Cerebrospinal<br>Meningitis.. | —              | —                | 2      | 5       | 1             | —                 | 1       | 2                   |
| Anterior<br>Poliomyelitis     | 3              | —                | 1      | 3       | 9             | 2                 | 3       | 10                  |
| Typhoid Fever                 | 3              | 5                | 53     | 48      | 6             | 7                 | 7       | 42                  |

\*Not reportable.

## PUBLIC HEALTH NURSING

RUBY M. SIMPSON, REG.N., AND FLORENCE H. M. EMORY, REG.N.

### THE THREE RIVERS DEMONSTRATION PROLONGED

A tuberculosis demonstration was inaugurated in December 1923, at Three Rivers, Quebec, by the Provincial Government with the financial assistance of the Canadian Tuberculosis Association, the Canadian Red Cross Society and the Sun Life Assurance Company of Canada. The reader is no doubt aware that Three Rivers is an industrial town of 35,000 inhabitants and is surrounded by an agricultural district, the population of which is scattered.

The nursing situation from a public health standpoint was difficult at first since it was almost impossible to find trained public health workers who could speak French fluently and with sufficient understanding of the French-Canadian character to do effective work. At the outset it was necessary to appoint two nurses without special training. These were given two months' experience at the Quebec dispensary, after which a French-speaking public health nurse, fully qualified, worked with them for six months giving instruction in home visiting and in the organization of the dispensary. This has proved very satisfactory and has produced two interested and practical health workers who are assisted by the weekly visits of a supervisor.

The dispensary staff is composed of one full-time doctor and two nurses. To date 13,578 patients have been ex-

amined and 22,048 consultations given. Of the former, 1,133 cases were found to have tuberculosis: 320 men, 464 women and 349 children. The seminaries and convent schools have their pupils examined regularly at the dispensary, and during the past year all of the nuns and priests requested an examination. In two convent schools the dispensary doctor was asked to examine all new teachers before appointment. Directions regarding hygiene and prophylaxis are carried out; this is a distinct improvement. At the beginning considerable opposition existed. The church has done a great deal to further the work in advising its parishioners to come to the dispensary and to carry out instructions given. That means much in a population composed largely of French-Canadians. Material relief is provided when necessary by the Society of St. Vincent de Paul.

In July and August of the past three years a summer camp has been conducted for pre-tuberculous children; the first two years 100 attended, last year 130 were accommodated. Such service has resulted in marked improvement in the general health of the children. The Sisters of Providence take over the management of the camp, going there in rotation as a holiday, and a cadet from the La Salle Academy gives physical instruction to

the children and teaches them swimming. The demonstration committee also supervises the work done at the two child welfare centres, the nurses co-operating with the tuberculosis dispensary in the detection of cases.

The results of general health education evidenced in Three Rivers speak more eloquently of success than can mere figures. The original five year demonstration period which terminates in December 1928 has been extended for a further period of two years, at the conclusion of which the general health of the city should show considerable improvement and the demonstration prove altogether worth while.

*Margaret E. Johnson.*

#### A CORRESPONDENCE COURSE FOR MOTHERS

**P**LANS to disseminate information relating to health are many and varied. Perhaps the most unique, recently encountered, is the Correspondence Course for Mothers, conducted by the Board of Health of the Commonwealth of Virginia. This course aims to go one step farther than the usual pre-natal letter, in that it provides a means of assurance that the mother has actually read and has understood the material submitted to her. The course, which was organized in 1923, is directed by a public health nurse who has had a wide experience in infant work and also in teaching. The lessons have been carefully prepared and are arranged in two parts—part one, six lessons, deals with pre-natal care; part two, six lessons, deals with the health of the infant and young child. The

language is clear and simple, each lesson being as brief as is compatible with understanding. Only one phase of a subject is treated in each lesson.

Leaflets are used and the mothers are instructed to write the answers to the questions which accompany each leaflet. The answer papers are then submitted to the State Board of Health, where they are carefully read and corrected by the Director and returned to the student. Every encouragement is given the asking of questions related to the work. These are answered and returned with the leaflets. Throughout the course, reference reading is supplied in the form of bulletins from the Federal Children's Bureau, each dealing with the subject contained in the lesson with which it is sent. In connection with the pre-natal instruction, layette and binder patterns are sent if desired. Progress may be rapid or slow, depending entirely upon the mother herself, as the second leaflet is not sent out until the first has been returned. Six months is considered an average time for the completion of the twelve lessons, but in many cases it extends throughout a full year. A certificate is given when the course is completed. For the most part the leaflets go to individuals, but in a few cases recently they have been sent to groups. The lesson material is studied in the group and the answers submitted by one of the number acting as secretary. Public health nurses consider this to be an excellent plan following a series of lectures with a class in home nursing, and have so recommended to several of their groups.



The problem encountered in beginning the work was to secure as students mothers in all parts of the State, but particularly those remote from medical and nursing services. To this end considerable publicity was given the venture in newspapers throughout the country; doctors, ministers and school teachers were circularized; social workers, nurses and all extension instructors were asked to spread the information regarding it in each community which they reached. Public health nurses now recruit many students. Each mother, on completing the lessons, is asked to submit the names of friends likely to

be interested. An application card follows closely the prospect of a new student. The Director states that a special card sent to persons, names of whom are obtained through the vital statistics records, has brought an excellent response.

State wide interest in this interesting experiment is developing rapidly. To date 1421 certificates have been issued and 1,100 mothers and prospective mothers are enrolled on the active list at the present time. The Course is indicative of a determination on the part of Virginia to reach its entire population with health education.

## LABORATORY SECTION

G. B. REED, PH.D.

### THE ETIOLOGY OF TRACHOMA

IN the death of Hideyo Noguchi a few weeks ago experimental medicine and bacteriology have lost one of their ablest exponents. It may be recalled that Noguchi, following his detailed work on snake venoms and antitoxins, came into prominence some eighteen years ago, as a result of his cultivation of the spirochaete of syphilis. Success in this field appears to have resulted largely from his adoption and development of new cultural methods, a method of attack responsible for many of his achievements. Following this fundamental work on syphilis there have followed voluminous series of papers on haemolysis, complement fixation, other spirochaetes, filterable viruses, especi-

ally poliomyelitis, and on the etiology of yellow fever.

The dramatic history of yellow fever, from the work of Walter Reed and associates in 1900 and the subsequent near elimination of the disease from the American tropics by public health effort, seemed to have reached its climax, and it may still prove to be the case, in Noguchi's demonstration of a leptospira as the etiological agent. This study was begun in Peru in 1918 and continued up to the time when he fell a victim to the disease, a few weeks ago in West Africa.

Of several important interludes in this exhaustive study of yellow fever, probably the last was his study of the etiology of trachoma, the report of

which occupies an entire supplementary number of the *Journal of Experimental Medicine*\*, just off the press, and is marked as accepted for publication October 27th, 1927, two days after he left New York for West Africa. This forms, therefore, probably the last publication of this quite remarkable Japanese-American, although posthumous publication of his study of African yellow fever is anticipated.

The most significant feature of this trachoma study was the detailed cultural examination of excised trachomatous conjunctiva from five characteristic cases of one to two years' standing. Cultures were made from this material in a variety of media, including the semisolid serum-water-haemoglobin agar used in his leptospira work and the ascitic fluid fresh-tissue medium used in his treponema cultivation. A large number of cultures were made and every colony on each of the media was studied in detail. This resulted in the isolation of five groups of bacteria: staphylococci and *C. xerosis* from all the cases: sarcinoids, a gram negative yellow pigmented bacillus, and an organism, *Bact. granulosis*, resembling *C. xerosis* but described as a new species, from four of the five cases. The pathogenicity of each of these organisms was then tested by injection of emulsions into the conjunctiva of a group of monkeys. All produced negative results or inflammatory reactions totally different from trachoma with the conspicuous exception of the new species, *B. granulosis*, which produced in monkeys a granular conjunctivitis closely resembling trachoma in man.

This new species, isolated from four of the five cases studied both in blood agar incubated at 30°C and in the leptospira medium, so resembles *C. xerosis* that Noguchi remarked that, had he not resolved to test on monkeys the pathogenicity of all species which grew from the trachomatous material, he would have passed it over as an innocuous variant of that species. It is described as a small rod 0.25-0.30 by 0.8-1.2 microns, actively motile on certain media, failing to grow on plain agar, growing on blood agar only at temperatures below 37°, although on the leptospira media it grows at temperatures up to 37°C, and differing from both *C. xerosis* and diphtheriae in fermentation reactions.

Pure cultures of the *B. granulosis* in thick suspensions injected into the subconjunctival tissue of a considerable number of *Macacus* monkeys and chimpanzees invariably produced "a granular conjunctivitis resembling closely, and apparently identical with, trachomatous granular conjunctivitis in man". The histological changes, too, corresponded closely with those of human trachoma, including the characteristic follicle and scar tissue formation. Monkeys inoculated with other species of bacteria from the original trachomatous material served as controls. Finally, the chronic granular conjunctivitis of the monkeys originally inoculated with the pure cultures of *Bact. granulosis* was transferred by direct tissue passage to a second series of lower monkeys, chimpanzees and an orang-outang, and, in several instances, through four successive passages. The lesions were shown to be infective as early as the

17th day and as late as the 204th day after the original culture inoculation. Bact. granulosis was recovered from the lesions of the animals inoculated with the cultures and from the tissue passage animals.

This paper is profusely illustrated with section photographs and coloured figures of infected eyes. Altogether it gives a rather convincing picture of

the etiology of trachoma. However, until Noguchi's results have been further tested it is perhaps too soon to estimate the possible advantage of such an examination in diagnosis or of its influence on present public health procedure.

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\*Noguchi, Hideyo, Jour. Exp. Med. XLVIII, Supplement 2, August 1928.

## NUTRITION

LEXA DENNE, B.A.

**H**OLIDAYS are now over and when we turn our thoughts to the more serious problem of fall and winter we are immediately confronted with preparations for the return to school and all that it involves. Even with the average family this is often an economical strain with all the extra expense of clothing, but with the families earning from \$17.00 to \$25.00 per week, and paying \$25.00 per month rent the harassed mother has an insurmountable problem, and three-quarters of our children come from such homes.

Coincident with the clothing problem there is the food problem, which is even more urgent, as Bobbie can go bare-foot but he must eat. Many of our school children walk or ride long distances in the early morning without breakfast and remain in school all day with nothing but a cold lunch at noon. The heavy meal is eaten in the evening and then to bed. Such an arrangement of meals is almost the reverse of what it should be, and although great strides have

been made in the last few years, there is still plenty of room for improvement. From November to April, 9,000 to 10,000 of Toronto's children are existing on House of Industry supplies, which are quite adequate for proper nourishment if their mothers had sufficient knowledge, fuel, and equipment to prepare them. This problem of under-nourishment is not confined to Toronto, but can be found in many of the districts of our country, and is responsible for many after ills and weaknesses in later life.

Hungry children may be present in our schools, but this problem does not explain the more general one of malnutrition. A well balanced day's meals are easy to plan if the mother has a knowledge of food values and 35c to 50c per day per person to spend on food; but when the amount is far below that there will naturally be a shortage of butter-fat, vitamins, and mineral content, and often the child's menu will consist of porridge for breakfast, bread and jam for lunch and more jam and bread for tea;

fattening, we will admit, if served in sufficient quantity, but not giving the healthy fat that resists disease.

We have household science classes in a great many of our schools, and, where there is a heavy curriculum, food work can be related to the other courses requiring little extra time. The source and manufacture of food may be studied in its relation to geography, commerce, and agriculture; food composition and nutritive value stands as a part of physiology; points in canning, preservation and care of food are closely related to

hygiene and sanitation. The cost of food, including the study of production, markets and the keeping of accounts can easily be correlated with arithmetic, commercial work, agriculture and economics.

Up to the present time the contribution to the general nutrition problem has been mainly curative. In order to make any impression on this problem from the preventive point of view, concentrated action on the point of every doctor, nurse, social worker, home economist and teacher is required.

## NATIONAL VOLUNTARY HEALTH AGENCIES

JEAN E. BROWNE, REG.N.

### LITTLE MOTHERS' LEAGUE

**I**N many Victorian Order centres the nurse, in addition to her bedside, ante-natal and infant welfare service, carries a particular piece of public health work known as "Little Mothers' League Classes", the object of which is to teach young girls how to handle and care for babies and young children.

A "Little Mothers' League" is composed of girls twelve years of age and over. The group is organized, appoints officers, and, as far as possible, conducts its own business. The nurse-instructor is usually made Honorary President.

The course of instruction covers approximately twelve lessons, lasting at least an hour each. Half of this

lesson time is devoted to practice work by the students.

At the close of the course an examination is set. This consists of an oral and practical portion, and of a paper written by each girl on the proper care of infants. Marks are awarded for this, and successful students receive a certificate.

The Little Mothers' League graduation exercises are usually a very pleasant event. The girls each have a special piece of work assigned to them by their instructor. These demonstrations afford pleasure to the parents and friends present, and indeed to the girls themselves, and are a proof of the good work that has been accomplished.

# PUBLIC HEALTH ENGINEERING

T. J. LAFRENIÈRE, C.E. AND A. E. BERRY, C.E., PH.D.

## THREE STUDIES OF SEWAGE CHLORINATION

THE application of chlorination to sewage treatment processes is rapidly gaining favour, and a number of studies in this work have been made recently.

At Independence, Kan., a city of 15,000 people, the sewage is treated by Imhoff tanks, sprinkling filters and secondary settling tanks. Odour complaints became so pronounced that it was necessary to by-pass the filters although they appeared to be functioning properly. Chlorination of the raw sewage was finally adopted. It was found to be more satisfactory to apply the chlorine to the raw sewage rather than after it had been settled. In this way the odours could be readily controlled by an average of 32.2 pounds of chlorine per million gallons of sewage, and at a cost of approximately \$3.30 per million gallons.

At Bridgeport, Conn., chlorination was applied to the effluent of a fine screen sewage plant, with the object of determining the effect of such treatment upon the protection of bathing beach. The results obtained seem to indicate that for effective and dependable disinfection of the fine screen effluent a residual chlorine content of 0.3 p.p.m., after a contact period of ten minutes was required, and a residual of 0.5 p.p.m. was preferable.

At Schenectady, New York, experiments were conducted to determine

the effect of sewage chlorination upon the digestion of sewage sludge in Imhoff tanks. The chlorine was applied before the sewage entered the tanks. The criteria of digestion was taken as methane production and hydrogen-ion concentration. The results seem to indicate a more rapid gasification during the critical stages (four to six weeks) of digestion. The possible cause of this occurrence is given as due to the fact that chlorination may cause the coagulation and precipitation of finely divided matter that does not settle out in ordinary sedimentation. This is easily digested and would tend to increase the initial rate of gas production.

*Engineering News Record,*  
Dec. 29, 1927.

## SEPTIC SORE THROAT MILK EPIDEMIC

A serious epidemic of septic sore throat has recently been experienced in Lee, Mass. To date there have been fifteen deaths and between three hundred and four hundred cases. The first case occurred in the person of a milker on a dairy supplying seventy per cent of the milk of the village. None of this was pasteurized. The outbreak spread rapidly, with most of the cases on the route served by the dairy involved. While some cases were not on this route, there were many opportunities to secure this milk



in restaurants and hotels. The health authorities believe that the outbreak will involve not less than five hundred individuals before it dies out—more

than ten per cent of the population.  
*"Health News," New York State  
Department of Health,  
July 16, 1928.*

## NEWS AND COMMENTS

P. A. T. SNEATH, M.B., D.P.H.

### HARBEN GOLD MEDAL

SIR Donald Ross has been awarded the Harben Gold Medal of the Royal Institute of Public Health. This medal is given triennially for "eminent services to public health, irrespective of nationality," and has been awarded in the past to such men as Pasteur and Lister.

### GREAT LAKES POLLUTION

THE International Joint Commission still has a few copies available of the Progress Report of the commission in regard to the Pollution of Boundary Waters, including the Report of the Sanitary Experts, 1914; Report of the Consulting Sanitary Engineer upon Remedial Measures, 1916, and the Final Report of the Commission, 1918. Copies of these documents may be obtained without charge on application to Lawrence J. Burpee, Secretary International Joint Commission, Ottawa, Ontario.

### DEPARTMENT OF PENSIONS AND NATIONAL HEALTH

The following appointments are to be noted from the Department of Pensions and National Health at Ottawa: Dr. Joseph Heagerty, D.P.H., has been appointed Medical and General Assistant in the office of the Chief

Executive; C. W. Chapman, appointed Chemist; and H. R. L. Hart, Assistant Chemist at Toronto.

### NOVA SCOTIA

THE Massachusetts - Halifax Health Commission ceased its activities the end of May. Several of the clinics which were conducted by the Commission, will be continued under the direction of the Victorian Order of Nurses. Dr. Sieniewicz, who has been Acting Executive Officer for the Commission during the past few years, is visiting the more important tuberculosis clinic centres in Europe, and making a special study of the various phases of anti-tuberculosis work.

The Pictou County Medical Society have appointed a committee to inquire into the feasibility of establishing County Health Units. This is in accord with the growing recognition of the advantages of county or district full-time health units.

### QUEBEC

THE County Council of Chambly have decided to apply for the organization of full-time health units with a clinic. The centre for the health clinic will be Longueuil. It is probable that several additional units will be

organized this year, as the value of County Health Units is being rapidly recognized by municipal authorities throughout Quebec.

Plans have been completed for the Anti-diphtheria Campaign in the city of Montreal, and provision has been made for the immunization of children between the ages of one to ten years. The work has been organized by the Child Welfare Association under the direction of Dr. A. B. Chandler. Four clinics will be operated by the association in different parts of the city and a charge of fifty cents will be made for each child for the full course of three inoculations, the money to go towards the cost of the material. Each clinic will be operated by two doctors, five nurses and five volunteer workers.

#### ONTARIO

THE Minister of Health has authorized the establishment of a completely equipped dental clinic at the National Exhibition in Toronto. This is to be established for the purpose of emphasizing the dental features of the prevention of disease, but will be fully prepared to diagnose and offer advice with regard to the care of the mouth.

Dr. D. B. Wilson, D.P.H., who has been until recently on leave of absence from the International Health Board of the Rockefeller Foundation, has been sent to Rio de Janeiro, where yellow fever has made its re-appearance in South America.

#### MANITOBA

THE biennial meeting of the Canadian Nurses' Association was held at the Fort Garry Hotel, July

3rd to 7th, under the presidency of Miss Mabel F. Gray, head of the Department of Nursing, University of British Columbia. At the evening session of July 3rd, addresses of welcome were given by Miss A. E. Wells, representing the Manitoba Association of Graduate Nurses, Mayor MacLean, Hon. Dr. E. W. Montgomery, Dr. H. M. Speechly, representing the Manitoba Medical Association, and to these Miss Gray, the acting president, made reply. Prof. R. C. Wallace gave an address on the work of the public health nurse, particularly in outlying districts. The question of affiliation of the Canadian Nurses' Association with the Canadian Medical Association was under discussion, as was also the national enrolment of Canadian nurses for emergency service in times of disaster, war, etc. At the evening session of July 5th, addresses were given by Hon. R. A. Hoey, Minister of Education for Manitoba, by Miss Ruth Hallowes, Educational Director, College of Nursing, London, Eng., on "Tradition in English Nursing," and by Dr. A. T. Mathers on "Mental Hygiene and the Nurse."

Dr. D. A. Stewart of Ninette Sanatorium has organized an extensive Tuberculosis Clinic Service throughout the Province for this summer, and has already completed half his programme. This summer's work is a continuation of the splendid service rendered by Dr. Stewart and his associates in 1927, and it is expected that double the area will be reached this year. Dr. Stewart reports:

"It is more and more impressed upon us, from visit after visit

throughout the country, and cities as well, that a tremendous amount of the fundamental ill health of the people of the Province is not considered by the people themselves to be important enough to bring to a doctor and can be found only by some such gathering in of people as we have in these clinics. If the idea could be spread abroad of routine examination of people supposed to be well, but really not well, a tremendous amount of early and even late disease, that does not now come to the doctor, could be discovered. This branch of public health work could, we think, yield better returns than any other. There is perhaps no better way of getting it started than by clinics such as are being held. Few things could be more effective for the bettering of general health than the cleaning up of teeth."

The Health Exhibit and Health Service at the recent Provincial Exhibition at Brandon was a great success. The exhibit was separated into five sections, featuring nursing service; prevention of rickets; promotion of mental health in children; measures for maternal and child care; control of communicable diseases and prevention and care of Tuberculosis.

The Health Services included:

1st. Health conferences for infants and children of pre-school age held daily, 190 children being examined, of whom 85 were found to have defects.

A First Aid Station was provided, assisting 29 visitors at the Exhibition.

A Day Nursery for infants, supervised by Public Health Nurses, and a rest room for mothers were also much appreciated.

Public Health Education was also adequately attended to by the distribution of literature, practical demonstrations and talks.

#### ALBERTA

THE annual meeting of the Alberta Hospitals' Association was held in Calgary on June 25th and 26th and was well attended by representatives from many of the hospitals throughout the Province.

The following officers were elected for the coming year: Honorary President, Dr. R. G. Brett, Banff; President, Dr. A. H. Baker, Calgary; Vice-President, Dr. A. E. Archer, Lamont; Secretary, Dr. J. A. Montgomery, Edmonton.

The meeting of the Alberta Association of Public Health Officers was held in Calgary during the same period, and some of its sessions took place jointly with those of the Hospital Association. Several papers of much interest were read, and proposals made for the betterment of hospital affairs and of health conditions in the Province.

The Alberta Association of Public Health Officers elected the following officers: President, Dr. T. H. Whitelaw, Edmonton; Vice-President, Dr. Duncan Gow, Calgary; Secretary-Treasurer, Dr. S. Main, Edmonton.

An advisory board to the Department of Health has been named by the Provincial Government. The personnel consists of Dr. W. A. Wilson, President of the College of Physicians and Surgeons of Alberta, who will represent the medical profession; Dr. George Johnson, Registrar, representing the College of Physicians and Sur-

geons; Professor E. L. Pope, representing the Faculty of Medicine of Alberta University;; Dr. D. Gow, representing the Association of Provincial Health Officers; Dr. R. H. Smith, representing the Superintendents of City Hospitals. Representative

for the rural municipal hospitals, C. Stevenson, Secretary, Red Deer Municipal Hospital. The Alberta Nurses' Association will have a representative, and there will be two lay women and two laymen representatives.

## BOOK REVIEWS

D. T. FRASER, B.A., M.B., D.P.H. and R. R. McCLENAHAN, B.A., M.B., D.P.H.

**Immunity to Syphilis**—By Alan M. Chesney. Williams and Wilkins Co., Baltimore. 85 pages. Price \$2.50.

This small monograph is No. xii in a series of monographs on various medical subjects published by Williams and Wilkins Co. Dr. Chesney has given in very brief form an admirable summary of present knowledge on the subject of immunity in syphilis.

The author points out that, in spite of the immense amount of work that has been carried on, there is still a great deal to be learned about the subject. He states that all experiments to produce active immunity against the disease, through filtrates, vaccines, living virus and cultures, have been unsuccessful and that passive immunity through sera from those infected has not yet been obtained. In fact, he says "the mechanism of immunity in syphilis is not clearly understood—there is no clear evidence that it is due to antibodies in the blood, and the part played by the cellular structures is not fully established". Man seems unable, unaided,

to eliminate syphilis from the body but is able to react to it and to limit its extent. It would appear that the best that can happen, without treatment, is a condition of "ideal parasitism".

The 162 articles on the subject from which the author has collected his data, are listed at the back of the book. They demonstrate how much work on the subject has been done in Europe and especially in Germany.

The book is recommended to those who wish a concise and up-to-date résumé of present knowledge on the subject of immunity in syphilis.

R. R. McClenahan.

**Personal Hygiene Applied** — By Jesse Feiring Williams, M.D., Professor of Physical Education, Teachers' College, Columbia University. W. B. Saunders Company, Philadelphia and London. 458 pp. illustrated, third edition. Price \$2.00. Canadian agents, McAinsh & Co., Limited, Toronto.

This is the third edition of the book, the first having appeared six years ago. There are about forty

additional pages. New illustrations have been added and where necessary the text has been revised and brought up to date.

As the author points out in his preface, this is a book designed for the use of students, more especially those other than medical students. The book may be said to fulfil a dual purpose in that it presents in a very clear and well reasoned manner the social and idealistic aspects of the problem as well as the specific and technical information which of necessity must accompany the ambition to be healthy if results are to be obtained.

The definition of health given in the first chapter, "The quality of life that renders the individual fit to live most and to serve best", strikes a note which the author maintains throughout the first part of the book wherein

he outlines the social and economic side of the question in so far as it effects the individual and the community.

This, as it were, preamble is of considerable interest and forms a very well balanced complement to the remainder of the book. Various cults are dealt with and generally the reason and good sense of the reader are stimulated before specific details are considered.

There follow chapters dealing with the various anatomical systems such as the circulatory, and the skeletal, as well as chapters on nutrition, the hygiene of sexual life, and the prevention of specific diseases.

Altogether the book is very readable, up to date, and for the purpose for which it is intended, very useful.

*D. W. Cameron.*

## BOOKS RECEIVED

*International Clinics.* Edited by Henry W. Cattell, A.M., M.D. A Quarterly of illustrated lectures and especially prepared original articles. Vol. II, thirty-eighth series, 1928. Philadelphia and London, J. B. Lippincott Company. 344 pages, price \$10.00 a year.

*Defective Memory, Absent-Mindedness and Their Treatment.* By Arnold Lorand, M.D., Philadelphia, F. A. Davis Company, Publishers, 1926. 340 pages.

*Nutrition in Health and Disease for Nurses.* By Lenna F. Cooper, B.S., M.A., M.H.E., Edith M. Barber, B.S., M.S., and Helen S. Mitchell, B.A., Ph.D. Philadelphia and London, J. B. Lippincott Company. 102 illustrations, 574 pages, price \$3.50.

*The Inflammatory and Toxic Diseases of Bone.* By R. Lawford Knaggs, M.C., Bristol, John Wright and Sons, Ltd., 1926. 416 pages. Price in British Isles, 20/-.



## CURRENT HEALTH LITERATURE

*A Selected Public Health Bibliography with Annotations*

RUGGLES GEORGE, B.A., M.B., D.P.H.

**Endemic Goitre**—An account of progress in goitre prevention leads the writer to believe that by further study of the cause and prevention of goitre and by the application of scientific facts now established, it should be possible to abolish endemic goitre within another generation.

KIMBALL, O. P. Endemic Goitre and Public Health. *The American Journal of Public Health*, May 1928, page 587.

**Tuberculosis Mortality** — The writer presents statistics showing the extent of the decline in tuberculosis mortality and attributes this decline to improvement in health education, increased interest in sanitation and improvement in housing and working conditions, together with the special effort made against the tuberculosis problem itself.

PHILIP, SIR ROBERT. The Causes of the Decline in Tuberculosis Mortality. *British Medical Journal*, April 28, 1928, page 701.

**Health of Students** — A study from the Students' Health Service of Oberlin College, Ohio, shows a significantly higher percentage of illness among all groups of self-supporting students than in the corresponding financially independent groups.

BRADSHAW, R. W. Health of the Self-Supporting College Student. *Journal of the American Medical Association*, June 2, 1928, page 1775.

**Scarlet Fever Antitoxin**—From an experience of over 1,100 cases the author concludes that scarlet fever antitoxin helps to reduce the severity of the febrile stage of scarlet fever and the frequency of complications.

GORDON, J. E. Convalescent and Antitoxic Serums in Scarlet Fever. *Journal of the American Medical Association*, May 19, 1928, page 1604.

**Diphtheria Immunization** — A progress report of diphtheria prevention work in New York State, exclusive of New York City, during 1928.

Report of the New York State Medical Society on Immunization of Children Against Diphtheria, *New York State Journal of Medicine*, May 15, 1928, page 604.

**Health in High Schools**—Suggestions prepared by the Child Health and Nutrition Department of the New Jersey Tuberculosis League.

Some Suggestions for the Promotion of Health Education in High Schools. *Health Bulletin* (New Jersey Tuberculosis League), June 1928, page 4.

**Rural School Health** — Suggestions for a Rural School Health programme and an outline of proposed activities.

ROGERS, J. F. Ten Steps in the Promotion of Health in Rural Schools. *School Life*, June 1928, page 187.



